50 Years of Neurology History
Welcome to the Department of Neurology’s 50th Anniversary Celebration! Whether you visited Rochester or were here in spirit, we hope these pages and the events brought back fond memories and rekindled friendships from years gone by.

It was on July 1, 1966 when Robert J. Joynt was appointed Chair of a newly created Department of Neurology at the University of Rochester. While much has changed in 50 years, we really do remain, as you remember us; snow in the winter, lilacs in the Spring, festivals all summer long, beautiful Septembers and yes, great residents learning from great faculty and great faculty learning from great residents – and actually having fun while doing it.

We thank the many individuals who organized and coordinated the 50th Anniversary Celebration. The creativity, energy & enthusiasm put forth by all of them was tremendous. “Many hands make light work” and each one of them deserves a special thanks.

Department of Neurology, 50th Anniversary Committees

**Logistics Committee**
Ralph Jozefowicz, MD
Lorie Wolfanger
Clara Vigelette
Lisa Oppelt
Christy Miller
Erin Bory
Diane Frank
Scott Verrenti

**Finance Committee**
Brenda Geglia
Ralph Jozefowicz, MD
Robert Holloway, MD, MPH
Erin Bory
Sarah Uschold
Diane Frank
Lorie Wolfanger
Clara Vigelette
Scott Verrenti

**Program Committee**
Robert Gross, MD, PhD
Jonathan Mink, MD, PhD
Kevin Biglan, MD, MPH
Marc Halterman, MD, PhD

**Timeline Committee**
Robert Holloway, MD, MPH
Ralph Jozefowicz, MD
Gerald Honch, MD
Lisa Oppelt
Patrick Phalen

**Publications Committee**
Robert Griggs, MD
Robert Holloway, MD, MPH
Gary Myers, MD
Gerald Honch, MD
Brittany Ellison

**Neuro Story Committee**
Gerald Honch, MD
Robert Griggs, MD
Gary Myers, MD
Richard Mosley, MD
Steve Brown

**IT**
Steve Brown
Peter Kapatos

**Photography**
Peter Kapatos

We hope you look as fondly back on your years in Rochester as we remember them.

My very best,
Robert Holloway, MD, MPH (Chair, 2012-present)

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In Memorium

While we reflect on where we have been, where we are, and where we are going, it’s important to remember from where we came. While these faculty, trainees, and staff may no longer be with us, they were inspirations, mentors, friends, and colleagues to many of us. They passed on the gift of their knowledge and decisively influenced the field of medicine and neurology around the globe. We are forever indebted to all them and this Department would not be what it is today without the enormous impact they have had on us personally and the field of neurology in general.

We dedicate this celebration to the wonderful memories provided by all of them.

Robert Joynt
Fred Horner
Josh Hollander
Richard Satran
David Goldblatt
David Marsh
Maurice Charlton
Steve Schwid
David Loiselle
James Garbern
Kenneth Plotkin
William Markesbery
Bernard Macik
Donald Castle
Marvin Goldstein
Andrew Vadasz
Nancy Benjamin
The Department of Neurology at the University of Rochester officially started on July 1, 1966 when Dr. Robert Joynt was recruited from the University of Iowa to become its first Chairman. From those humble beginnings, Dr. Joynt and six faculty and trainees began a journey of professional and personal growth that would impact thousands of physicians and millions of patients. While one can attempt to quantify such accomplishments, it is ultimately a human story of relationships and how a rare combination of Dr. Joynt’s great intellect, common sense, humility, wit, and charm can move the neurological needle on a global scale.

In 50 brief years, we have grown into a Department of over 100 faculty, 30 residents, 15 fellows, 28 nurse practitioners and physician assistants, over 70 nurses, technicians, and social workers, 30 research coordinators, and over 140 staff: 13 divisions and 3 Centers (Center for Human Experimental Therapeutics, Center for Neural Development and Disease, and Center for Translational Neuromedicine) with an annual budget of over $61 million to oversee our clinical (>35,000 outpatients annual visits, >1,000 procedures, >2,000 inpatient admissions), research (>90 grants, >250 peer-reviewed publications), and educational programs consistently ranked as tops at the Medical Center and World Report as one of the nation’s best, a model and leader in all subspecialty areas, obtaining the NINDS-funded Center for Translational Neuromedicine (so then to be the Center for NeuroTherapeutics Discovery (CND)). Subsequently, when Dr. Steve Goldman was Chairman (2008 to 2012), the Department’s academic stature increased further, including the activities of his own Center for Translational Neuromedicine (CNT) which is one of the most productive centers for basic and early stage translational neuroscience in the world.

Over the past 4 years (2012 to present), the Department has accomplished a great deal to support our ambitious strategic plan: 1) radically change clinical practice; 2) strategic research growth; 3) targeted educational efforts; 4) develop new leaders; 5) intense relationship building, and 6) financial stability. As the academic environment has become increasingly complex, we have greatly benefited by excellent relationships with our various stakeholders, including other Departments and Centers, UIARC hospitals, academic deans, and medical faculty group leadership.

We have ever-improving and expanding educational and research programs each became internationally prominent. Key milestone events during Dr. Griggs’ chairmanship included recruiting and supporting world-class faculty and leaders in all subspecialty areas, obtaining the NINDS-sponsored T32 post-doctoral training grant in Experimental Therapeutics of Neurological diseases (1990 and now in its 26th year), establishing the Strong Epilepsy Center (1990), opening the Stroke Unit (1996), creating a community-based practice in general neurology, (1993), tapping Ralph Jozefowicz to lead nearly all educational programs (1993-1996), strengthening relationship with the Strong Memorial Hospital and expanding to Highland Hospital (2004), and creating vibrant partnerships with allied research centers, including the Clinical Trials Coordinating Center (now called the Center for Human Experimental Therapeutics (CHET), the Center for Translational Neuro-medicine (CTN) and the Center for Neural Development and Disease program (2013) for children and 29 (2013) for adult and child neurology residency programs (7% of graduating classes compared to 1% nationally), and 28 of our residents received the Arnold Gold Foundation Humanism in Medicine Award from the 4th year medical students (33% of the awards given). In addition to our adult and child neurology residency programs, we have 10 fellowships (clinical neurophysiology, movement disorders, clinical neurology, neuro-infectious disease, neuro-oncology, movement disorders, neuro-immunology, behavioral neuroscience, and experimental therapeutics), with plans to develop fellowships in neuro-critical care and headache.

What is even more impressive than the growth and accomplishments of the Department is the magnitude and impact of our alumni who moved on to establish careers elsewhere. Since our first graduating residents in 1969 (Marvin Goldstein and Donald Castle), we have graduated over 250 adult and child neurology residents, 70 experimental therapeutics fellows, over 100 clinical fellows, and over 50 faculty alumni. The impact they have made on the field of neurology is nothing short of astonishing.
And so our journey continues….our work is but begun. To our next 50 years. Meliora.

Rochester neurology of core values, shared experiences, and professional accomplishments that will keep us together 50 years hence. Not many, but a few who will join in that centennial event, celebrating that particular brand of neurology. Just as there are faculty and staff who are still with us nearly 50 years later, so too will there be faculty and staff with us 50 years hence. There is no need to repeat them here – we are familiar with many, if not most, of them. What we have been witness to is a unique blend of individuals that have created and sustained a department of character.

The patient will remain at the center of all we do guiding our way, remembering that the most important things we do in our lives, we do for others. While we have heard many motivating “-isms” and powerful simple phrases, they are only words on a page. There is no need to repeat them here – we are familiar with many, if not most, of them. What we have seen and experienced is a unique blend of individuals that have created and sustained a department of character. Where kindness, wisdom, and a deep appreciation of the human condition prevail. In our ever changing world of medicine, such ideals are more important now than ever. They are the things that create legacies and make “institutions” endure. We must pass them forward to generations to come.

Just as there are faculty and staff who are still with us nearly 50 years later, so too will there be faculty and staff with us 50 years hence. Not many, but a few who will join in that centennial event, celebrating that particular brand of Rochester neurology of core values, shared experiences, and professional accomplishments that will keep us together forever.

And so our journey continues….our work is but begun. To our next 50 years. Meliora.
matched into adult neurology residency programs and 29 matched into child neurology residency programs! These students are the most competitive neurology training programs, including both Harvard programs, Johns Hopkins, UCSF, UCLA, University of Pennsylvania, University of Michigan and the University of Virginia. Thirty-two students matched into our own residency programs, including 25 in adult neurology and 7 in child neurology.

At present, the UR neurology clerkship is the most highly rated clinical clerkship in Rochester with a 99% satisfaction rate. Students praise the priority that neurology faculty and residents place on teaching as well as the emphasis on the development of physical examination skills and clinical reasoning. Clinical sites for the clerkship include the inpatient, consultation, pediatric neurology and Neuromedicine ICU services at SMH and Highland Hospital, as well as outpatient sites at Bushnell’s Basin and Linden Oakes. Drs. Robert Hoffway, Gerald Honch, Ralph Józefowicz, Jennifer Kwon, Fred Marshall, Jon Mink and Rob Stone have received multiple teaching awards from the medical students for their teaching efforts in the neurology clerkship, representing the single largest contribution from any department in the medical center.

Residency programs – Adult Neurology

The UR neurology residency program began shortly after the arrival of Robert Joynt as chair of the department in 1967. Jerry Honch and Marvin Goldstein were among the very first residents in the program. Dr. David Marsh was appointed as the first residency program director and steadily expanded the size of the program to 4 adult positions and 1 child position per year. Dr. Roger Kurlan became program director in 1987 and continued to expand the program size and create a more structured curriculum and expanded elective and ambulatory rotations. Ralph Józefowicz became adult neurology program director in 1996 and continues to run the program to this day, and is ably assisted by Clara Vigelette, the residency program coordinator. In 2004 the residency program was expanded to 5 positions per year, which allowed us to set up a night float rotation and eliminate overnight call so that we could be fully compliant with the new work hour restrictions. In 2006 the residency program became a four-year categorical program, fully integrating the preliminary internship year into the curriculum. In 2009, the residency program was further expanded to 6 positions per year.

At present, the UR adult neurology residency program is considered to be one of the top programs nationally, and consistently recruits highly competitive candidates from across the US. This past year, we received 574 applications and interviewed 62 candidates for 6 adult positions. The residency program has always maintained full accreditation by the Residency Review Committee in Neurology and boasts a 96% first time pass rate for the ABPN board examination since 2000. Our neurology residents consistently receive a disproportionate number of medical student teaching awards and are recognized for their high quality teaching and role modeling. Over the past 16 years, 28 of our residents received the Arnold Gold Foundation Humanism in Medicine Award from the 4th year medical students, which represent 33% of the awards given! Fifteen of our residents were selected for AOA membership by the 4th year class over the past 16 years, and seven residents received the medical student graduation award at convocation.

Our residency graduates all pursue fellowship training, with many electing to stay in Rochester. Since 2001, 52 of our residency graduates stayed to pursue fellowships in clinical neurophysiology (22), experimental therapeutics (7), vascular neurology (7), neuromuscular medicine (4) as well as other departmental fellowships (12). Fifteen of our graduates pursued fellowship training at outside institutions, including the University of Pennsylvania, Washington University, Mayo Clinic, Sloan-Kettering, Cleveland Clinic, University of Michigan and Vanderbilt University. The majority of our residency graduates become academicians and many have gone on to become department chairs and residency program directors.

Residency programs – Child Neurology

The child neurology residency program was established by Dr. Fred Horner during his tenure in the department. Dr. Leon Epstein took over the program when he became chief of child neurology. Dr. Jonathan Mink re-established the child neurology residency program in 2003, starting with one position per year. In 2006 the program was expanded to two positions per year. In 2013, Dr. Robert Thompson-Stone was appointed program director for the Child Neurology residency training program and is ably assisted by Magda Ramzy, child neurology program coordinator.

At present, the UR child neurology residency program is considered to be one of the top programs nationally, and consistently recruits highly competitive candidates from across the US. This past year, we received 122 applications and interviewed 32 candidates for two child positions. The residency program has always maintained full accreditation by the Residency Review Committee in Neurology.

Included in the above statistics on teaching awards are our child neurology residents, who have also won a disproportionate number of awards and accolades. Since 2003, more medical students at the UR have entered child neurology training programs than from any other medical school in the country. In fact, each year almost 3% of the UR medical student graduating class selects child neurology residency training, which is triple the national average.

Many of our child neurology residency graduates pursue fellowship training, with a large number electing to stay in Rochester. Since 2009, ten of our residency graduates pursued fellowships, nine of which were completed at Rochester. These fellowships included sleep medicine (2), movement disorders (1), epilepsy and experimental therapeutics (2), neuromuscular medicine, vascular neurology, sleep medicine. The United Council for Neurologic Subspecialties (UCNS) was established in 2006 and presently accredits nine neurologic subspecialties. Dr. Józefowicz currently chairs the UCNS. Our department currently sponsors five ACGME fellowships, one UCNS fellowship and four departmental fellowships, as listed below.

<table>
<thead>
<tr>
<th>Positions</th>
<th>Fellowship director</th>
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<tbody>
<tr>
<td>ACGME fellowships</td>
<td></td>
</tr>
<tr>
<td>Clinical neurophysiology</td>
<td>2</td>
</tr>
<tr>
<td>Vascular neurology</td>
<td>2</td>
</tr>
<tr>
<td>Neuromuscular medicine</td>
<td>2</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>2</td>
</tr>
<tr>
<td>Sleep medicine</td>
<td>1</td>
</tr>
<tr>
<td>UCNS fellowship</td>
<td></td>
</tr>
<tr>
<td>Neuro-oncology</td>
<td>1</td>
</tr>
<tr>
<td>Departmental fellowships</td>
<td></td>
</tr>
<tr>
<td>Experimental therapeutics</td>
<td>4-6</td>
</tr>
<tr>
<td>Movement disorders</td>
<td>2</td>
</tr>
<tr>
<td>Neuro-immunology</td>
<td>1</td>
</tr>
<tr>
<td>Behavioral neurology</td>
<td>1</td>
</tr>
</tbody>
</table>

Plans are underway to develop fellowships in Neuro-critical care and in Headache Medicine. Additional information concerning these fellowships is included in the individual unit updates.
The department has had a strong history of superb academic achievements, particularly in research and education. Academic Affairs has as its portfolio the recruitment and retention of faculty, with collaborative efforts with others as to mentoring and career building. The long tenure of our two chairs, with assured stability of this portfolio for much of its history, though in its early days, the department did not have a need for a formally appointed Associate Chair. Dr. Richard Maeyd served in this position during Robert Griggs’ tenure as chair, and, as Vice Chair, Robert Holloway served in this role during Steve Goldman’s term, forming a defined Promotion and Tenure Committee. Dr. Holloway appointed Robert Gross upon the former’s acceptance of the chair.

Tenure and Promotions:
Over the 50 years of the department, there have been changes in the way our institution views criteria for promotion and tenure. We no longer have “tracks”; rather, individuals are evaluated on the various components of their jobs, with appropriate standards based on academic rank (increasing recognition of expertise, from local to national or international, for example). As the primary item in the Academic Affairs portfolio, we have revised our internal standards with the institution. Our Promotion and Tenure Committee serves, in essence, as the intra-departmental ad hoc committee, setting the qualifications of our faculty as a surrogate for the institutional committee. When appropriate, input is sought from the Senior Associate Dean of Academic Affairs.

We have organized the tenure and promotion process to be more transparent, reflecting the goals of the medical center’s processes for advancement. There is a formal committee that oversees the tenure and promotion process, chaired by the Associate Chair for Academic Affairs, with the Vice Chair serving ex officio. Members of the committee are drawn from senior members of the department, most of whom are tenured; there are set terms, so that other faculty may have the opportunity to serve, and so the thinking within the committee does not become ‘stale.’ Candidates for re-appointment are brought to the committee after discussion among the unit chiefs and chair (with input from the committee chair as needed); the candidate’s portfolio is reviewed for completeness and to assure that the documentation would support a successful review for re-appointment or promotion (with tenure, as appropriate).

To ensure greater transparency as to the criteria, we have developed a survey that each candidate reviews and amends on a yearly basis, which serves as the basis for discussion with unit chief or chair. This form was developed in collaboration with the recently developed Women in Neurology Committee (founded and chaired by Emma Ciafaloni), as a targeted effort to support the retention and promotion of women, with the recognition that the process was generalizable to all faculty.

As the criteria for re-appointments and promotions have evolved at the medical center, we have updated our procedures and criteria by which we evaluate individual faculty. In a related area, we have developed a clear policy about volunteer faculty, including expectations of service.

Mentoring and Training:
Some activities within the Academic Affairs portfolio overlap with those of education. We have developed new programs for residents and fellows.

Recognizing the relative paucity of education in career development for residents, we have started a seminar series entitled ‘Crafting your Neurology Career’ (CYNC). Seminars follow a multi-year schedule, and are a mixture of research talks by our faculty (autobiography mixed with ongoing research topics) and seminars designed to help residents and fellows plan their next career moves: there are presentations about careers in academia, practice and industry; how to negotiate a contract (and what matters); work-life balance; and writing for publication. Fellows are invited to this series, but there is an independent skills-building series for fellows, with overlapping content.

We have started an early mentorship program for residents. Faculty-resident dyads are established in the R1 year. The idea is for the residents and their mentor to meet as desired, to discuss career goals, any challenges or impediments in their training, etc. We have avoided assigning residents to their firm supervisor, recognizing that there might be too much of a conflict of interest! The expectation is that faculty may serve as career mentors primarily early on, but that as the interests of the resident develop, there may be a ‘hand-off’ to other, ‘content’ or ‘career’ mentors, as appropriate and desired.

Faculty Development/Retention:
Two recent initiatives are worth mentioning. The Women in Neurology group, developed and led by Emma Ciafaloni, was instrumental in arranging seminars with topics related to career balance and development. Heidi Schwarz, in an effort related to her service as chair of the AAN Practice Committee, has directed a ‘burnout task force, working within a larger medical center-wide effort. The goal is to survey faculty, assess the level of burnout, and to develop mitigation strategies. The ultimate goal is ‘wellness,’ which will benefit our faculty, of course, but will benefit our patients as well.

One of the historical strengths of the department has been mentoring. On this foundation, we have developed additional measures to assure faculty success. Faculty recruitment involves specific language in their offer letter about mentoring, and, ideally, will outline the members of the mentoring team and specific items to be covered. Discussion with the unit chiefs have been directed towards emphasizing the importance of mentoring and the need for individual faculty – particularly, junior faculty – to have a mentoring team, whatever the emphasis of their work.

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Two steering committees meet monthly to oversee clinical operations of the department (Acute Services, chaired by Dr. Benesch, and Ambulatory Care, formerly chaired by Dr. Tony Maroldo and currently headed by Dr. Holloway). These committees comprise clinical providers, administrators, billing personnel, housestaff, and quality officers who address benchmarks, new initiatives, and on-going practice activities. Efforts are focused on maintaining our high level of quality care as well as meeting specific goals of the University of Rochester Medical Faculty Group, such as providing early access for new patient evaluations, minimizing bump rates for scheduled patients, and securing timely discharges from the inpatient service.

Clinical Volumes and Revenues

<table>
<thead>
<tr>
<th>Service</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>694</td>
<td>817</td>
<td>937</td>
</tr>
<tr>
<td>General</td>
<td>1,170</td>
<td>1,005</td>
<td>852</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>315</td>
<td>333</td>
<td>343</td>
</tr>
<tr>
<td>Total</td>
<td>2,179</td>
<td>2,155</td>
<td>2,132</td>
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Clinical Revenues

<table>
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<tr>
<th>Visit Type</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow up</td>
<td>18,688</td>
<td>20,373</td>
<td>23,886</td>
</tr>
<tr>
<td>New</td>
<td>6,754</td>
<td>7,376</td>
<td>8,448</td>
</tr>
<tr>
<td>Total</td>
<td>25,442</td>
<td>27,749</td>
<td>32,334</td>
</tr>
</tbody>
</table>

Nursing utilizes bedside handoff at the change of each shift so that each transfer of care engages the staff, patients, and family members. This verbal communication and screen summary is essential in promoting patient safety by having a visual check on the patient and including the patient in the plan of care. Educating patients is an essential part of each admission and an integral part of remaining a Comprehensive Stroke Center.

Another unique 5-1600 initiative is comfort/safety rounding which occurs at set times throughout the day. The nursing and PCT staff pair and round or check on each patient to address all issues. Incorporated into the daily routine is 51600's fall program where each patient is specifically assessed and proper fall prevention equipment can be utilized. Both providers and nurses are well educated on fall prevention and prioritize patient safety on the unit.

Physical therapists, occupational therapists, speech pathologists and Social Work providers all provide specialized care to the patients admitted to our Neurology service, across all specialties.

Highland Hospital

The Department of Neurology's Highland Hospital neurology service was started in 2005 under the leadership of Dr. Heidi Schwarz. Soon after, in 2007, Highland Hospital was designated as a New York State Primary Stroke Center through the work of Dr. Schwarz and fellow members of the hospital's stroke team. A newly remodeled inpatient unit on East 7, focusing on the care of patients with stroke and other neurological and neuropsychological conditions, was opened in 2011. Many faculty members have played a key role in the success of the Highland neurology service in the past and present, as part of the outpatient clinic, inpatient consult team, or both.

The outpatient clinic at Highland was consolidated with the practice at Westfall Road in 2010, but the department still maintains an active inpatient consult service, with Dr. Adam Kelly as the current chief of this program. The census of the service typically includes 6-8 patients, translating into an annual volume of roughly 2,500 encounters. Dr. Kelly also serves as the director of the hospital's stroke center, which has maintained its stroke center designation and is consistently awarded the American Stroke Association's Gold Plus Award for continued high performance on quality measures.

Highland Hospital is continually recognized for its excellent care of inpatients with neurological disorders, and as an outstanding site for neurology resident and medical student education. First-year neurological residents gain some of their first experiences directing a consultation service, and in the process, begin their development as independent, autonomous neurologists. This is in large part due to the culture of the hospital, which is a tertiary care facility, attached to a university and its current status as a key affiliate of a world-class academic medical center. Moving forward, Highland will be expected to play a large role in the department's and medical center's plans to further expand care to patients across the region.

Outpatient Care

Outpatient centers of care for the Department of Neurology are located at Westfall Road, the Sleep Center, the combined Vascular Neurology/Neurological Surgery office at 2180 South Clinton Avenue, Bushnell's Basin, and the Ambulatory Care Facility (AC-1) adjacent to Strong Memorial Hospital. Currently, 15 nurses and 8 clinical technicians provide care across the outpatient clinic locations. The clinical technicians obtain vital signs, height, and weight, perform screening evaluations, and help the patient through the clinical appointment. Nursing staff perform infusion therapy, assist with Botex injections, triage phone calls, including my chart messages, and communicate with providers and patients. The suite at 919 Westfall Road has recently expanded as the department was able to acquire additional space (8,500 sq ft), allowing for 10 additional examination rooms, 3 large procedure rooms, and 6 recovery bays for Botex treatments. Clerical and scheduling personnel (Access Center) will now be housed there as well. In 2017, all child neurology ambulatory clinics and Pediatric Epilepsy will be relocated to a new facility on East River Road.

Multidisciplinary Team Care

Advanced Practice Providers. Advanced Practice Providers (APPs), including nurse practitioners (NPs) and physician assistants (PAs), today are a mainstay in providing patient care in the department. In 1977, Katharine Donohoe, NP, was hired to work in the Neuromuscular Division and paved the way for many to follow. Historically, APPs were used in a variety of roles, often providing medical and nursing care to sub-specialty populations. Currently, there are 20 Nurse Practitioners and 5 Physician Assistants working in General Neurology, Stroke, Headache, Neuroimmunology, Neuromuscular, Neuro Oncology, Epilepsy and the Movement Disorders divisions. Additionally, 5 NPs work in Child Neurology, as well as 5 NPs and PAs work in the Neumedicine Critical Care Unit.

In outpatient settings, APPs work with a team diagnosing and treating both chronic and acute conditions. These skills encompass comprehensive history and physical examination; preventive screening and health assessment; ordering and interpreting laboratory, imaging studies, and other diagnostic tests; and prescribing medication, physical, occupational and speech therapy, assistive devices...
and durable medical equipment. Crucial roles also include education and teaching individuals, families, groups and other members of the health care team.

In the acute care environment, the Stroke APPs round with the team on the neurology unit, care for and manage a subset of patients, conduct histories, neurological assessments, diagnosis, and develop and execute treatment plans with the physician team. They conduct family meetings, discharge planning, and facilitate increased throughput and reduce length of stay. They respond to stroke codes and insures stroke standards of care are met for every patient. In addition, they see patients in follow up clinic post discharge. APP Neuromedicine Critical Care team members provide care 24/7, and work with intensivists to care for critically ill patients and independently manage patient assignments.

APPs can be credentialed to provide a variety of procedures across divisions including muscle and nerve biopsies, Botex and trigger point injections, nerve blocks, lumbar punctures, as well as programming of devices such as the vagus nerve stimulator (VNS), responsive nerve stimulator (RNS), deep brain stimulator (DBS) and intrathecal pumps. In Critical Care, APPs place central venous catheters and arterial lines, perform ultrasonography, and under supervision, intubate and place chest tubes. Amy Vierheil, NP, in Child Neurology, is a leader in developing a telemedicine program for children with neurological disease. Patricia Rogers, NP, Ann Leonardit, NP, and Amy Vierheil, NP, are candidates for the Doctor of Nursing Practice at the University of Rochester School of Nursing and several other APPs have appointments as Clinical Associates. Some have published and lectured nationally on their areas of expertise.

Expansion of clinical programs

Infusion Center:
The infusion center continues to grow rapidly, now providing nearly 4000 infusion encounters annually, for patients with multiple sclerosis, neuromuscular disease, headache, and auto-immune disorders.

Lumbar Puncture (“LP”) clinic:
This project was spear-headed by Dr. Justin Chandler, Neurology resident, in 2015, and overseen by Dr. Nimish Mule, with the goal of providing access for Neurology patients to undergo spinal taps. Patients are scheduled each week for the procedure which provides a supervised, Mohile, with the goal of providing access for Neurology patients on their areas of expertise.

Clinical Associates. Some have published and lectured nationally on their areas of expertise.

Regional Expansion:
Extensive efforts are underway to expand clinical services across the region, headed by Dr. Richard Barbano, Associate Chair for Regional Development, with collaborations and affiliations with numerous hospitals in upstate New York. Dr. Karen Odrzywolski heads the Neurology Program at Auburn Memorial Hospital, and Dr. Deana Bono, recently joined the practice group at Cayuga Medical Center, to provide leadership for the URMC Telestroke Unit, in collaboration with the Department of Neurology at URMC. Telestroke is expanding throughout the region, with the initial goal of faculty members within the Stroke Unit providing 24/7 emergent telestroke consultations with 5 sites: Cayuga Medical Center, Arnot-Ogden Memorial Hospital, Wyoming County Community Hospital, Auburn Memorial Hospital, and St. Joseph’s Hospital Health Center. Expanded services of tele-neurology are likely to follow in 2017.

Neuro-Medical Intensive Care Unit:
This Unit opened in 2014 with the creation of the new 12-bed NMICU on 8-1200, allowing for expansion of our programs in cerebrovascular disease, epilepsy monitoring, and neuro-critical care. Dr. Debra Roberts serves as the Director of the Unit, with the recent hiring of Dr. Christopher Zammit, certified in both Emergency Medicine and Neuro-critical Care, further enhancing the program.

Program Overview

Despite its focus providing world-class care and research in the clinical arena, many members of the Department of Neurology have a track record of continuous funding for their work in basic and translational neuroscience and maintain close ties with the neuroscience research community at the University of Rochester. In 2015, NIH research support to research faculty in the Department of Neurology alone totaled $171.1 million, which resulted in a ranking of 9th in total NIH funding among all medical schools. The institution has also continued to make substantive investments in basic research, including the opening of the Kornberg medical research building and the MRB-extension (MRBX) in 1998 and 2002, respectively, which house both the Center for Neural Development and Disease and the Center for Translational Neuromedicine. Indeed, these changes have catapulted Rochester into the ranks of the country’s premier neuroscience research institutions.

Departmental Research Faculty

Relative to other institutions, the University of Rochester is unique with regards to the balance, breadth and depth in the areas of cellular and molecular neuroscience, systems neuroscience and clinical research. And true to the history of the institution, the work being done across the URMC campus remains highly collaborative in nature with faculty holding multiple appointments, working with colleagues across basic and clinical departments. These include the Department of Neuroscience, Center for Neurodevelopment & Disease, Center for Translational Neuromedicine, Center for Visual Science, Brain and Cognitive Science among others.

Many current departmental faculty serve as the principal investigator (PI) for major research projects sponsored by the NIH, Department of Defense, private foundations and other agencies. These laboratories are engaged in discovering the basic mechanisms and potential treatments for a broad range of disorders including stroke, dementia, HIV/AIDS, neuromuscular disorders, and multiple sclerosis. Our faculty are also asking systems level questions to better understand how the nervous system integrates visual inputs, regulates complex movements and other higher level functions in both developmental and disease paradigms. Here are just a few examples of the work being done by our faculty in the Department of Neurology:

Charles Duffy, M.D., Ph.D. The Cognitive Neuroscience Laboratory focuses on cortical information processing in aging and Alzheimer’s disease. We combine neurophysiological and psychophysical analyses of visual processing in humans and monkeys. Our studies of human aging and Alzheimer’s disease have identified specific defects in visual information processing that precede symptom onset in Alzheimer’s disease and provide biomarkers of disease vulnerability and progression. Our studies in monkeys use a diverse set of visual displays combined with single neuron recordings, intracortical field potentials, and intracranial evoked potentials to bridge the gaps between human neurophysiology and cellular neurophysiology. Our studies have led to the founding of Cerebral Assessment Systems, Inc., which was recently granted the world’s first FDA approval for a dementia test.

Harris Gelbard, M.D., Ph.D. The Gelbard lab is interested in glial and immune effector cell interactions with synapses during neuroinflammation. Focusing on HIV-1 associated neurocognitive disorders (HANDs), the lab has characterized the effects of pro-inflammatory metabolites, viral gene products and other neurotoxins on normal immune effector functions in the CNS as well as synaptic function. This line of investigation has lead to the identification and commercial development of lead compounds for the treatment of a variety of neuroinflammatory conditions, as well as peripheral diseases including non-alcoholic steatohepatitis and congestive heart failure/schizophrenia-reperfusion injury.

Steven Goldman, M.D., Ph.D. The Goldman Lab seeks to understand the regulatory control of stem and progenitor cells of the human CNS, and to utilize that knowledge to design new approaches for treating neurological conditions.
Marc H. Schieber, M.D., Ph.D. The Schieber Lab investigates how the brain controls movements of the body, and translates these brain-motor behaviors into interface technology for restoration and repair of lost or damaged neurological function. A longstanding line of investigation explores control of fine finger movements, like those used in typing, playing a musical instrument, or performing delicate surgery. More recent work explores the combination of reaching, grasping, and manipulating. In both realms, their group studies how the brain controls a range of complex sequences of muscle activity to achieve the required movement. In addition to traditional neurophysiological approaches, recent studies use brain-computer interfaces to explore brain function beyond that accessible through normal behavior.

Aina Schor, M.D., Ph.D. The Schor lab is focused on the preclinical pharmacology of targeted therapies for neuroblastoma, a deadly childhood cancer. Of particular interest are the roles of neurotrophin receptors and other developmentally regulated neural crest proteins in signaling pathways contributing to resistance to chemotherapy of neuroblastoma cells.

Charles Thornton, M.D. The Thornton Lab has studied the molecular basis for neurogenetic disorders including myotonic dystrophy. Working in close collaboration with Richard Moxley, M.D., the Thornton Lab has made an exciting progress not only characterizing the molecular basis for myotonic dystrophy, but also in completing seminal studies of molecular mechanisms for the disorder. Partnering with Ionis Pharmaceuticals, Thornton and colleagues have shown that injection with antisense oligonucleotides improves muscle function in a mouse model of DMT. Also created in their lab, clinical trials are now underway to investigate the potential of translating this approach in the clinic.

Marc Halterman, M.D., Ph.D. The Halterman lab is developing treatments for acute ischemia and reperfusion injury following stroke or brain injury. Their studies are geared towards identifying druggable nodes in ischemia-induced transcriptional circuits that regulate selective neuronal vulnerability, neuroinflammation and neuroplasticity. The team is also investigating how modulation of peripheral immunological priming that occurs in the gut and lung could be used to reduce collateral brain injury following cardiac arrest. Their work has resulted in several patents related to improvements in viral vector delivery and ischemic drug discovery. The lab is also collaborating with industry partners to develop novel anti-apoptotic and anti-inflammatory small molecules for stroke and other disorders in which ischemia is a central component.

Jonathan Mink, M.D., Ph.D. The Mink Lab uses electrophysiology, imaging and other advanced neurophysiological approaches to understand function of the basal ganglia in normal control of movement and the pathophysiology of basal ganglia disorders characterized by abnormal involuntary movements. Translational work includes understanding the natural history of juvenile neuronal ceroid lipofuscinoses (Batten Disease) and pursuing potential disease modifying therapeutics.

Alex Paciorkowski, M.D. The Paciorkowski Lab focuses on gene discovery in developmental brain disorders including autism, brain malformations, intellectual disability, and epilepsy. The laboratory uses a unique approach involving rare gene variant detection and next-generation sequencing (NGS) analyses performed on parent-child trios to identify putative disease causing genes. Putative disease targets are analyzed in pre-clinical biological models to establish genotype-phenotype correlations. Dr. Paciorkowski has also developed new bioinformatics tools to analyze both laboratory and clinical next generation sequencing (NGS) data. The Schieber Lab is interested in how plastic neural mechanisms adaptively adjust to maintain proper spatial calibration across sensory modalities and how support recovery after suffering pathologic loss.
The Movement division took form in 1975 when Bob Joynt recruited Ira Shoulson back to the UR after he completed his US Public Health service as a clinical and research fellow in experimental therapeutics at the National Institutes of Health (NIH, NINDS). Ira developed a clinic for movement disorders as he completed his training in internal medicine and neurology. Interests in clinical care and research broadened from Parkinson disease to the hereditary disorders Huntington disease and Wilson disease. Patients became families and families became patients. Unmet needs multiplied. Charlyne Miller soon joined Ira Shoulson as the first nursing director in the Department in order to expand the care and outreach for persons affected by movement disorders. Later Peter Como joined the unit to provide much needed help in neuropsychology and behavioral interventions.

Experimental therapeutics became the clinical and research focus of the unit. Ira Shoulson in turn recruited Bob Joynt, David Goldblatt, and Maurice Charlton to conduct a trial of levodopa treatment for Parkinson disease. In the early 1970s, movement disorders emerged as a nascent neurological discipline, and many non-movement neurologic diseases, the division was renamed from MIND to the Movement Division which he ably led for a decade. In 1989, Ira Shoulson and David Oakes of the Department of Biostatistics joined forces under the leadership of Bench Griggs to craft the “Experimental Therapeutics of Neurological Disorders Program”, which has trained many movement disorder fellows who have gone on to distinguish themselves in academia, industry and government. Kevin Biglan, Karen Blindauer, Tors DeMarcadoa, Theresa Dimitso-poulos, Ray Dorsey, Andrew Fergin, David Finkelstein, Samuel Frank, Tom Guttuso, Don Higgins, Penny Hogarth, Chris Hyson, Karl Kieburtz, David Lichter, Lisa Magumdar, Mark Mapstone, David Marcus, Fred Marshall, Jill Miller, Chris O’Brien, Irene Richard, Garrett Riggs, Allen Rubin, Heidi Schwarz, Steven Schwid, Andrew Siderowf, David Song, Kim Trinidad, Miriam Weber, Joanna Wojcieszek, Lin Zhang, Tiffini Voss, Rachel Biemiller, and Kelly Andrzejewski.

The clinical research focus of the Division was embedded in the early 1980s through a series of enduring collaborations with the Division and then Department of Biostatistics. Ira Shoulson and Charles Oderoff collaborated on the “Baclofen as Protective Therapy in Huntington Disease” study, which was the first of many placebo-controlled trials sponsored by NIH. Despite Charlie’s untimely death from cancer, the collaboration with biostatistics continued to thrive and endure as David Oakes took over the biostatistics program that was further enhanced by the addition of Michael McDermott. In 1984-85, Ira Shoulson, David Oakes, and Stanley Fahn (Houston Merritt Professor, Columbia University) joined forces to conceive and organize the DATATOP (Doprenyl and Tocopherol Anti-Oxidative Therapy of Parkinson) clinical trial. This multi-center effort, sponsored by NIH, involved 29 research sites in the US and Canada, nearly 70 investigators and coordinators who would successfully recruit and enroll 800 patients with early Parkinson disease. The findings from DATATOP are still being analyzed and published to provide information about clinical trial design, the natural history of Parkinson disease, placebo effects, and biomarkers. DATATOP was also the lynchpin for many other multi-center studies to follow under the aegis of the Parkinson Study Group (PSG), which was established in 1986 and has since been headquartered in Rochester.

The DATATOP clinical trial also provided the makings of a unique infrastructure to organize, support and coordinate multi-center clinical trials. Karl Kieburtz arrived on the scene in 1989 to emmesh himself in the DATATOP trial and soon thereafter in the creation of a splendid resource to facilitate clinical research: The Clinical Trials Coordination Center (CTCC) which was established within the Movement Division initially to support the work of the PSG.

Karl Kieburtz served as chief of the Movement Division from 1999 until 2005. With clinical trials continuing to be a major strength, the division successfully recruited Bernard Ravina from the NIH as its next chief in 2005. Bernard oversaw the establishment of Experimental Therapeutics as a fully independent Center commensurate with its expanded role in the Medical Center. Clinical services such as the Botulinum Toxin Clinic, organized and directed under Jau-Shin Lou in 1993 and later directed by Rich Barbano starting in 1995, continued to grow. The division kept pace with advancing therapies for Parkinson’s disease by opening the deep brain stimulation program and Intraperitoneal levodopa infusion program, offering our patients with Parkinson’s Disease cutting edge therapeutics.

In 2012, Rich Barbano took over as chief of the division. With the growing recognition of the inherited nature of many non-movement neurologic diseases, the division name was shortened from MIND to the Movement Disorders in 2014. Over the past four plus decades, the Movement Division has continued to enjoy success in carrying out its mission to improve care and treatments for our patients and families. The division remains very involved with multiple research protocols and is expanding the field of care delivery through its rapidly growing telemedicine initiatives under Ray Dorsey and Kevin Biglan.
Facilitated by the addition of Katherine Donohoe RN, the care, teaching, and research programs of the Unit, Moxley became Director of the Strong Memorial Hospital. During the 1980s New York State also provided funding to Dr. Griggs and the NMD Unit to undertake a study of the natural history and genetic mechanism of facioscapulohumeral muscular dystrophy (FSHD). This funding allowed the hiring of Dr. Denise Figlewicz PhD as assistant professor in 1993 to establish a FSHD genetics laboratory to search for and to characterize the underlying mutation responsible for this second most common form of adult muscular dystrophy. Dr. Figlewicz remained in the NMD Division until 2002, before moving to University of Michigan. Dr. Rabi Tawil, a graduate of University of Beirut School of Medicine, and the University of Rochester Department of Neurology Residency program and NMD fellowship program, joined the NMD faculty in 1993, teaming up with Drs. Figlewicz and Griggs in the study of FSHD and Periodic Paralyses with Dr. Griggs. Dr. Tawil became Professor of Neurology in 2005, and the Fields Professor of Neurology in 2015. The NMD Division was further strengthened in 1998, when Dr. Eric Logigian joined the Division as Professor of Neurology, having previously been Associate Professor of Neurology and EMG laboratory Director at Harvard University’s Brigham and Women’s Hospital. Dr. Logigian assumed the leadership of the UR EMG laboratory in 1998, and succeeded Dr. Moxley in 2001 as Chief of the NMD Division. Dr. David Herrmann, who completed his Neurology and NMD training at University of Michigan, joined the Division as junior faculty in 1999, to grow electrodiagnostic and NMD Pathology laboratory services and develop a dedicated Neuropathy Clinic. He became Professor of Neurology and Pathology in 2013, and took over the reins as NMD Division Chief in 2015. The NMD Division saw further growth in the 21st century, as Dr. Robert (Berch) C. Griggs joined the Department of Neurology and Pathology in 2013, and took tenured Professor of Neurology in 2006, and continued his internationally acclaimed research in myotonic dystrophy. Dr. Figlewicz teamed up with Dr. Moxley in the study of myotonic dystrophy, establishing a laboratory aimed at clarifying the pathomechanism of myotonic dystrophy. Dr. Thornton rapidly rose through the ranks to become a tenured Professor of Neurology in 2006, and continues his internationally acclaimed research in myotonic dystrophy. In 2012, Dr. Thornton was installed as the Saunders Distinguished Professor of Neurology.

The Neuromuscular (NMD) Unit had its start in 1971 when Dr. Robert (Berch) C. Griggs joined the Department of Neurology, Medicine, and Pediatrics, as Assistant Professor. Shortly after joining Dr. Griggs assumed directorship of the MDA NMD Clinic in 1972. In parallel, Dr. Griggs worked with Barbara Herr, Assistant Professor of Neurology, to establish the Strong Memorial Hospital Muscle and Nerve Histopathology Laboratory. The large number of patients referred to our NMD Clinic created a challenging experience that captivated house staff and enhanced teaching, diagnosis, and treatment of NMD disease. Further enhancing were Dr. David VanDyke and Dr. Gary Myers, Department of Pediatrics and Neurology, recruited by Dr. Fred Horner in 1970 and 1971. In 1974 the clinical, teaching, and research structure of the NMD Unit gained further energy and breadth with the recruitment of Dr. Richard T. Moxley III, who had received his neurology training along with Dr. VanDyke and Dr. Myers at the Harvard-Longwood Medical Center. Dr. Moxley became Director of the Strong Memorial Hospital EMG Laboratory and initiated an NIH-funded clinical research program with a focus on muscle wasting in myotonic dystrophy. Dr. Griggs became Director and Dr. Moxley Co-Director of this newly formed Unit. During the 70s and 80s there was vast growth of the clinical care, teaching, and research programs of the Unit, facilitated by the addition of Katherine Donohoe RN, who subsequently became a faculty member and leader in the School of Nursing. “KD” enhanced the treatment of patients with myasthenia gravis, and worked with Dr. David Goldblatt to establish an ALS Clinic. The MDA-funded Clinical Investigations in Duchenne Dystrophy (CIDD), had its start in the late 1970s and continued into the early 1990s. Dr. Griggs worked with colleagues nationally to initiate this study of the natural history of Duchenne muscular dystrophy (DMD). He and Dr. Moxley played important roles in the many treatment trials performed by the CIDD. A critical factor in the success of the CIDD was the collaborative interaction with the clinical evaluator Shree Pandya D.P.T. M.S. Shree joins our patients, families, and all the CIDD group in celebrating a major accomplishment; the discovery that prednisone is an effective treatment for DMD. Shree is Associate Professor of Neurology, and an international leader in the design of endpoint measures for therapeutic trials in NMD.

The NMD Division in 2016: In 2016, the NMD Division comprises 8 physician faculty, 2 nurse practitioners (Cynthia Gibson and Debra Guntrum), a nurse (Joan Mountain), 2 physical therapists (Shree Pandya and Dr. Kate Eichinger), research coordinators and research data managers, laboratory managers, technicians and postdoctoral fellows in its NMDV pathology and research laboratories.

Clinical Care: Members of the NMD Division care for patients in its MDA, ALS and peripheral neuropathy clinics, and conduct electrodiagnostic studies and muscle, nerve and skin biopsies. The NMD Division provides clinical care and diagnostic services to patients throughout the upstate New York Region, and evaluates patients from across the U.S. and internationally. Drs Tawil and Ciafaloni, direct a weekly multidisciplinary MDA clinic which cares for over 1500 patients annually. Dr. Thornton has lead efforts along with Drs. Tawil, Ciafaloni, and Heatwole, to develop the multidisciplinary ALS clinic that cares for about 275 patients/year. This effort has been supported in part by generous philanthropic efforts by the Peter Lawrence annual golf event. Dr. Emma Ciafaloni leads the Division efforts in pediatric NMD Disease and has developed a large multidisciplinary Duchenne’s muscular dystrophy (DMD) center within the MDA clinic. Dr. David Herrmann, along with Dr. Eric Logigian and Dr. Michael Stanton spearhead clinics dedicated to the care of patients with peripheral neuropathies with over 1500 patients annually, including a multidisciplinary, tertiary referral clinic for patients with Inherited Neuropathies (Charcot Marie Tooth Disease) led by Dr. Hermann. Cynthia Gibson and Debra Guntrum and Dr. Kate Eichinger support each of these clinics and the coordinated care of patients. Under the stewardship of Dr. Eric Logigian and Michele Ferguson (laboratory manager), the University of Rochester EMG laboratory is a state of the art, AANEM accredited laboratory, performing over 2600 EMGs annually. Dr. Logigian has developed a state of the art EMG database that powers the laboratory. In 2015, Dr.

NEUROMUSCULAR DIVISION
By: David Herrmann, M.D.

The Neuromuscular (NMD) Unit had its start in 1971 when Dr. Robert (Berch) C. Griggs joined the Department of Neurology, Medicine, and Pediatrics, as Assistant Professor. Shortly after joining Dr. Griggs assumed directorship of the MDA NMD Clinic in 1972. In parallel, Dr. Griggs worked with Barbara Herr, Assistant Professor of Neurology, to establish the Strong Memorial Hospital Muscle and Nerve Histopathology Laboratory. The large number of patients referred to our NMD Clinic created a challenging experience that captivated house staff and enhanced teaching, diagnosis, and treatment of NMD disease. Further enhancing were Dr. David VanDyke and Dr. Gary Myers, Department of Pediatrics and Neurology, recruited by Dr. Fred Horner in 1970 and 1971. In 1974 the clinical, teaching, and research structure of the NMD Unit gained further energy and breadth with the recruitment of Dr. Richard T. Moxley III, who had received his neurology training along with Dr. VanDyke and Dr. Myers at the Harvard-Longwood Medical Center. Dr. Moxley became Director of the Strong Memorial Hospital EMG Laboratory and initiated an NIH-funded clinical research program with a focus on muscle wasting in myotonic dystrophy. Dr. Griggs became Director and Dr. Moxley Co-Director of this newly formed Unit. During the 70s and 80s there was vast growth of the clinical care, teaching, and research programs of the Unit, facilitated by the addition of Katherine Donohoe RN, who subsequently became a faculty member and leader in the School of Nursing. “KD” enhanced the treatment of patients with myasthenia gravis, and worked with Dr. David Goldblatt to establish an ALS Clinic. The MDA-funded Clinical Investigations in Duchenne Dystrophy (CIDD), had its start in the late 1970s and continued into the early 1990s. Dr. Griggs worked with colleagues nationally to initiate this study of the natural history of Duchenne muscular dystrophy (DMD). He and Dr. Moxley played important roles in the many treatment trials performed by the CIDD. A critical factor in the success of the CIDD was the collaborative interaction with the clinical evaluator Shree Pandya D.P.T. M.S. Shree joins our patients, families, and all the CIDD group in celebrating a major accomplishment; the discovery that prednisone is an effective treatment for DMD. Shree is Associate Professor of Neurology, and an international leader in the design of endpoint measures for therapeutic trials in NMD.

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Logian pioneered integration of NMD ultrasound with electrodagnostic testing in the Upstate New York area. The NMD Pathology laboratory under the Direction of Dr. Tawil, Donald Henderson (laboratory manager), Bharat Shah (technician), and Dr. Herrmann is a referral laboratory, processing and interpreting over 600 muscle, nerve and skin biopsies (for epidermal nerve fiber density) annually.

The highly integrated, multidisciplinary clinical programs offered by the NMD Division, are enabled by administrative support, led by Erin Collins.

**Education**

The NMD Division's Education Programs parallel its excellence in clinical care. The Division is home to AGCME accredited NMD medicine (Dr. Ciafaloni, Program Director) and Clinical Fellowship Programs (Dr. Logigian, Program Director). Mrs. Karen Lee is administrator of these programs. These AGCME accredited fellowship programs have graduated 60 trainees over the past 25 years. Additional training opportunities are available in the NMD Division via a myriad of Departmental and Research fellowship opportunities.

**Research**

The NMD Division continues as a national standout in research in inherited and rare NMD disorders and has 34 active research grants. Dr. Richard Moxley and Dr. Charles Thornton continue to lead national and internationally acclaimed efforts toward an effective therapy for myotonic dystrophy type 1. Key accomplishments by Dr. Thornton include development of an animal model for myotonic dystrophy type 1 (DM1), identification of RNA-mediated toxicity as the disease mechanism, development of effective morpholino treatment of an animal model of DM1, and partnering with Industry to bring this therapy to early phase human trials. Dr. Moxley has pioneered mesencephalon for myotonia in DM1, and development of a disease registry for myotonic dystrophy. The bedside to bench to bedside work in DM1 has been enabled by sustained extramural funding through the NIH and Foundations, including the Senator Wellstone Myotonic Dystrophy Research Center at University of Rochester.

The University of Rochester has been a leader in child neurology as a subspecialty since its inception. In the 1940s a number of UR graduates (Drs. Philip Dodge, Frederick Horn-er, Patrick Bray, Jasper Daube) were inspired by Dr. Wilbur Horner, MD Endowed Professor in Pediatric Neurology to pursue child neurology and they became pioneers in our field. One of them, Dr. Horner, returned to URMC in 1967 and established the first division of child neurology. He and subsequently Dr. Leon Epstein trained a number of UR graduates (Drs. Philip Dodge, Frederick Horn-er, Patrick Bray, Jasper Daube) to be child neurologists and many adult neurologists how to care for children with neurological problems. In 2001, Jonathan Mink was recruited to lead the Division of Child Neurology. Since then, the division has evolved further and our training, clinical and research programs have expanded substantially. In 2014, Dr. Mink was named the Frederick A. Horner, MD Endowed Professor in Pediatric Neurology in memory of the founding Chief.

**Clinical Activities**

The Division of Child Neurology receives patient referrals from most counties in New York State, including Buffalo and Syracuse. We now have over 7500 outpatient visits a year (up from just over 6000 in 2012) in the past year, patients have come from as far as California, Texas, Florida, Canada, Brazil, and India for consultation. The Inpatient Child Neurology Service evaluates children in the Emergency Department, the Neonatal Intensive Care Unit, the Pediatric Intensive Care Unit, on the pediatric units, and admits its own patients. We average over 600 inpatient consultations each year and admit an additional 200 patients to our service.

The NMD Division is a hub for Duchenne muscular dystrophy research. Drs. Ciafaloni and Griggs lead a vigorous experimental therapeutics program in DMD, while Drs. Ciafaloni and Shree Pandya collaborate in epidemiologic research in DMD, supported by the CDC MD SARTNET.

Dr. Heatwole's research focuses on the development of multiple disease-specific, patient reported clinical trial outcomes measures including those for DMD, myotonic dystrophy, congenital muscular dystrophy, Charcot-Marie-Tooth Disease, and spinal muscular atrophy. His work is supported by NIH and Foundation grants and philanthropy from the Goldberg Nathan Foundation for DMD research.

The NMD Division has active Peripheral Nerve Research Programs. Dr. Herrmann leads research in Charcot Marie Tooth Disease and related disorders through the NIH supported Inherited Neuropathies Consortium Rare Disease Clinic Research Center, and MDA supported North American CMT Database. Research conducts natural history, outcome measure and biomarker studies in inherited neuropathies with a goal of developing effective therapy for inherited neuropathies. Dr. Logigan works across peripheral neuropathies and NMD disorders to refine electrophysiologic approaches.

The research of the NMD Division would not be possible without the support of its clinical evaluators, led by physical therapist, Dr. Kate Eichinger, and a superb team of research coordinators (Jeanne Delkobrun, Susanne Heininger, jim Hilbert, Learn Lewis, Elizabeth Luebbe, Joan Mountain, Kim Hart, Patty Smith and Janet Soxden), a data management center and research administrators (Tracy Forrester and Adele Cook who is retiring in 2016 after 47 years with the Department of Neurology).

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**Our Faculty and Staff**

**Primary Faculty**

Jonathan W. Mink, MD PhD
Heather R. Adams, PhD
Erica F. Augustine, MD
David Bearden, MD, MS
Marina R. Connolly, MD
Haris A. Gelbard, MD, PhD
Inna Hughes, MD, PhD
Jennifer M. Kivon, MD, MPH
Gary J. Myers, MD
Alex Piaciorkowski, MD
Laurele E. Seltzer, DO
Robert Thompson Stone, MD
David Wang, MD

**Secondary Faculty**

Gretchen L. Birbeck, MD, MPH
Emma Ciafaloni, MD
Richard Moxley, MD
Nina Schor, MD, PhD
Laura Tomaselli, MD

**Nurses**

Amy Verhile, PNP
Lisa Augustoni, PNP
Carolyn Dickenson, PNP
Elaine Philipson, PNP
Julie Socha, PNP
Gyndi TenHoopen, PNP
Nicole Walsh, RN
Kathleen Wright, RN

**Genetic Counselor**

Kelly Q. Minks, MS

Our division provides care to children with all types of neurological problems. We have specific expertise in a number of disorders for which we have dedicated specialty clinics. These include attention deficit hyperactivity disorder; Battler disease (neuronal ceroid lipofuscinosis), epilepsy, headache, movement disorders, neurofibromatoses, neurogenetics, demyelinating disease, leukodystrophies, neurometabolic disorders, and Tourette Syndrome. In addition, we have collaborative clinical programs with other departments and divisions for children with autism, brain tumors, metabolic disorders, cerebral palsy, neonatal brachial plexus injury, and neural brain injury. The Neuropsychological Assessment Clinic provides comprehensive neuropsychological evaluations, neuropsychological consultation, and educational advocacy for children with neurocognitive impairment. The need for clinical
child neurology services in upstate and western New York continues to challenge our capacity. To meet the growing need to provide neurological care to children in upstate New York, we have recruited one new faculty member in the past year to bring our number to 13. In addition, we have 6 Pediatric Nurse Practitioners with specialty expertise in child neurology, two RNs, and a Genetic Counselor in our Division.

We have been recognized by being named a Batten Disease Support and Research Association Center of Excellence and a Tourette Association of America Center of Excellence. In addition, we have been named as a Children’s Tumor Foundation Neurofibromatosis Network Clinic. We have developed an innovative telemedicine consult program for ADHD (Amy Vierhile, PNP) and are developing a telemedicine program for evaluation and care of children with epilepsy (David Wang, MD).

Teaching Activities

The child neurology residency program was established by Dr. Fred Horner during his tenure in the department. Dr. Leon Epstein took over the program when he became chief of child neurology. Dr. Jonathan Mink re-established the child neurology residency program in 2003, starting with one position per year. In 2006 the program expanded to two positions per year. In 2013, Dr. Robert Thompson-Stone was appointed program director for the Child Neurology residency training program and is ably assisted by Magda Ramzy, child neurology program coordinator.

At present, the UR child neurology residency program is considered to be one of the top programs nationally, and consistently recruits highly competitive candidates from across the US. This past year, we received 122 applications and interviewed 32 candidates for two child positions. The residency program has always maintained full accreditation by the Residency Review Committee in Neurology.

Included in the above statistics on teaching awards are our child neurology residents, who have also won a disproportionate number of awards and accolades. Since 2003, more medical students at the UR have entered child neurology training programs than from any other medical school in the country. In fact, each year almost 3% of the UR medical student graduating class selects child neurology residency training, which is triple the national average.

Research and Scholarly Activity

Scope of Research:

The Division of Child Neurology has a robust research program. Eleven of our fourteen primary faculty, one of our PNPs, and our genetic counselor are engaged in funded research. The scope of the research includes neuroimmunology, motor control, movement disorders, Batten disease, genetics of epilepsy, biomarkers of infantile epilepsies, cognitive disorders, ADHD, and HIV/AIDS. Goals of our research range from understanding molecular, cellular, and neural systems mechanisms underlying disease to understanding the clinical characteristics, response to treatment, and public health aspects of complex neurological disorders of children.

Our faculty have published over 130 peer-reviewed papers in the past 3 years and have published numerous books and chapters in leading textbooks. Our grant portfolio is strong.

University of New Mexico. Randy Schiffer remained and Andrew Goodman was recruited from the Neuroimmunology Branch (NIH) in 1988 by Herndon and Berch Griggs. The following year David Mattson was also recruited from NIH. Fellows training under this group included Dan Giang, Steve Schwid, and Cornelia Mihai. By the end of the 1990’s Randy Schiffer had been recruited to Texas Tech University to be chair of Neuropsychiatry. David Mattson was recruited to Indiana University to direct their multiple sclerosis program. Steve Schwid had joined the faculty after completing the departmental experimental therapeutics fellowship and Ben Segal was recruited from NIH. After seven years of fruitful laboratory work in an animal model of MS, experimental autoimmune encephalomyelitis, Ben Segal was recruited to direct an endowed program at the University of Michigan. Lahar Mehta completed his fellowship training in experimental therapeutics during this time. Tragically by 2010, both Steve Schwid and Jim Garnern, who had been recruited from Wayne State University, succumbed to metastatic cancer. Since 2010, Andrew Goodman has recruited Megan Hyland former resident, Matt Bellizzi (former resident and fellow), and Jessica Robb (former resident and fellow) to the faculty. Larry Samkoff successfully transitioned from Rochester General Hospital to full time status at the URMC in Neuroimmunology.

Research

Under Bob Herndon, the group began seminal studies of interferon beta for the treatment of relapsing MS with Larry Jacobs in Buffalo. They also published important findings regarding the treatment of pseudo-bulbar behavior in MS patients with low dose amitriptyline. Following their departure, Herndon and Rudick continued as leading investigators in landmark studies of interferon beta begun in Rochester.

Faculty

Andrew D. Goodman, MD, Chief
Matthew Bellizzi, MD, PhD
Megan Hyland, MD; Medical Director, MS Center
Jessica Robb, MD
Lawrence Samkoff, MD

APP’s

Pamela Clark, MSN, NP
Jocelyn Dohrer, MSN, NP

Research Nurses

Cynthia Irish, RN
Eileen Scheid, RN, MSN

Current Fellows

Andrew D. Smith, III, MD
Tirsham Gyang, MD

Neuroimmunology Division history

The history of what is now the Neuroimmunology division dates back to the recruitment of Dr. Robert Herndon from Johns Hopkins in 1977. At Rochester, Bob assumed the dual role of both directing the Center for Brain Research and the first dedicated MS clinic. He developed a core group of faculty including Drs. Randy Schiffer, Rick Rudick, and Cory Ford (the latter two trained as residents and fellows). By the end of the 1980s, Dr. Rudick had been recruited to be the founding director of the Mellen Center for MS at the Cleveland Clinic. Bob Hemson was recruited to chair the neuroscience program at the Good Samaritan hospital, and Cory Ford was recruited to the

NEUROIMMUNOLOGY DIVISION

By: Andrew D. Goodman, MD, Chief

Scope of Research:

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Building on this tradition of experimental therapeutics research in MS, Schiffer, Giangi, Goodman, and Mattson were part of the pivotal trail leading to the approval of co-polymer 1 in MS (now known as Copaxone). Working with Steve Schwid (first as an experimental therapeutics fellow and later as a faculty member), Andrew Goodman began systematic investigation of 4-aminopyridine for symptomatic treatment of multiple sclerosis with particular emphasis on the impact of this drug on gait function. Ultimately, a series of studies led to the FDA-approval of dalfampridine (4-aminopyridine) for improving abnormal gait in people with MS.

It is an exciting time for our program as we embark on new clinical and research initiatives: Jess Robb and Megan Hyland are leading the implementation of our departmental telemedicine initiative aimed at improving access to care for a widely dispersed and traditionally underserved rural population of disabled individuals with neurological diseases such as MS; implementation of a NYSSTEM (New York State Stem Cell Science)-funded research: we propose to perform a phase 1 first-in-man study on new clinical and research initiatives: Jess Robb and Megan Hyland are leading the implementation of our departmental NIH-funded training grant. Our estimated adult MS population is over 3500 drawn from a broad catchment area encompassing all of upstate New York and the northern tier of Pennsylvania. The clinical staff includes a highly experienced team of research nurses, 2 NPs, a social worker, as well as an infusion center/nursing cadre. We also see patients with other CNS neuroimmunologic conditions including neuromyelitis optica, neurosarcoidosis, and autoimmune encephalitis. New initiatives include an inpatient consult service organized by Larry Samkoff.

Teaching

While the MS group has offered fellowship training since its inception, limited funding was always a daunting obstacle. However, since 2014, we have been among the first wave of seven institutions nationally to receive a five-year Institutional Clinician Training Award from the National Multiple Sclerosis Society (NMSS). Additional support for fellows interested in experimental therapeutics research may also be available from the NMSS or our departmental NIH-funded training grant.

Clinical

We provide state-of-the-art comprehensive care of MS patients in the setting of a university-based MS center for adults and an associated pediatric MS clinic (directed by former adult and child neurology trainee, Rob Stone). Our estimated adult MS population is over 3500 drawn from a broad catchment area encompassing all of upstate New York and the northern tier of Pennsylvania. The clinical staff includes a highly experienced team of research nurses, 2 NPs, a social worker, as well as an infusion center/nursing cadre. We also see patients with other CNS neuroimmunologic conditions including neuromyelitis optica, neurosarcoidosis, and autoimmune encephalitis. New initiatives include an inpatient consult service organized by Larry Samkoff.

Our Faculty and Staff

Neurology Faculty:

- Michel J. Berg, MD, Division Chief
- Gretchen Birbeck, MD, MPH, DTMH
- Deana Borno, MD
- A. James Fessler, MD
- Robert A. Gross, MD, PhD
- Lynn C. Liu, MD
- Olga Selioutski, DO
- Thomas Wychowski, MD

Neurophysiologists:

- James Burditch, PhD
- Michael Chilungu, MD

Neuropsychologists:

- Michael Privitera, MD
- John Langholtz, PhD

Pediatric Epilepsy:

- Inma Hughes, MD, PhD
- Laurie Setzer, DO
- David Wang, MD

Family Psychologists:

- William H. Watson, PhD

Neurosurgery:

- Webster Pitcher, MD, PhD

Epilepsy Unit:

- Giuseppe Erba, MD

Nurse Practitioners:

- Kathy England, FNP
- Patricia Rogers, ANP

Pediatricians:

- Julie Socha, FNP

The Strong Epilepsy Center (SEC) began in 1990 with 2 video-EEG long term monitoring beds on 5-1600. Today the SEC has 12 beds: 8 adult beds on 5-1600 and 4 pediatric beds in the Golisano Children’s Hospital (8 North). During the past 25 years, the SEC has served over 8,500 patients including performing over 600 epilepsy surgeries. Our clinical neurophysiology service performs 3,000 EEGs and 1.5 million minutes of intraoperative monitoring per year. The SEC is a regional program with one-half of the people we care for traveling from outside Monroe County.
to a better understanding of psychogenic seizures. The sub-
sequent appointments of John Langfitt, PhD, Betsy Wood, PhD, William Watson, PhD, Julie Fudge, MD, Paul Boo-Weiner, MD, and Michael Privitera, MD continued to expand
research and improve the psychosocial aspects of epilepsy
patients. Cesare Lombroso, MD, PhD, a pioneer in epilepsy,
joined us as a visiting professor.

Over the past 2.5 decades of the epilepsy program, numer-
ous superb faculty have joined our program. Several of these
faculty have since left our program for a variety of
reasons but each contributed to our improvement of pa-
tient care, fellow education and research activity. These fac-
ulty, who we were honored to work with, include: Charles
Duffy, MD, PhD, Lisa Oestreich, DO, Hady Behman, MD,
Maria Toczek, MD, Kenneth Plotkin, MD, J. Craig Henry,
MD and Adam Juenwisch, MD.

Our current adult epilepsy faculty include: Robert A.
Gross, MD, PhD, Michel Berg, MD, Lynn Liu, MD, A James
Fessler, MD, Olga Seloustski, DO, Gretchan Birbeck, MD,
PhD, Thomas Wychowski, MD, and most recently Deana
Bonito, MD. Our long time pediatric epilepsy provider, Da-
vid Wang, MD, has recently been joined by Laurie Seltzer,
DO and Inna Hughes, MD, PhD as we continue to expand
our pediatric epilepsy service.

Throughout this time, the Epilepsy Center has had a strong
contingent of APPs including our current, longstanding,
highly valued nurse practitioners: Patty Rogers, Kathy
England and Julie Socha and collaboration with Neuro-
surgery nurse practitioner, Susan Smith. Additionally, Lisa
Augustini has worked with our pediatric neurology col-
leagues running the new onset spell clinic for many years.
Patty McCabe, Jennifer Willison, Jan Anderson, Jeanne
Augostini has worked with our pediatric neurology col-
exiles running the new onset spell clinic for many years.

Since the advent of the Strong Epilepsy Center, there
has been a close working relationship among the faculty
among the neurologists, neurosurgeon, and neuropsychol-
gists meeting weekly to every other week to discuss our
epilepsy surgery cases.

The SEC has been at the forefront of treatment develop-
ment participating in over 25 clinical intervention studies
since its inception including the NIH sponsored early sur-
gery for epilepsy trial, the Responsive NeuroStimulator (RNS)
which is the most complex implantable medical device ever
made and well-designed studies of medical marijuana as
well as over 20 premarketing studies of almost all the new
AEDs approved by the FDA since 1990. Our current studies
also include cerebral malaria and other infectious causes of
epilepsy in Africa, electrophysiology and genetics of infant-
ile spasms, epileptogenicity of tumors, acute treatments of
super refractory status epilepticus, and generic medications.

The Epilepsy unit has a strong fellowship program with 2-5
trainees per year. During the past 25 years we have trained
over 70 neurophysiologists and epileptologists who now
practice throughout the United States and the world
including Thailand, Japan, and Iceland.

In memory: Special mention is appropriate of the valued
Epilepsy Unit faculty who have passed away. Drs. Maurice
Chaiton, Craig Applegate, Kenneth Plotkin, Cesare Lom-
broso, Richard Satan, and David Loiselle.
model to study the development of brain metastases from breast cancer. Bradley Mills PhD in the Marc Halterman lab is leading the investigation of phosphatase-mediated HIV-1 regulation in glioblastoma.

Our program aims to offer hope to patients with devastating diseases. Outside of clinical trials we offer aggressive and novel treatment options. We are the first program in upstate New York to offer the Optune device that was recently found to significantly improve survival in patients with Glioblastoma. We offer patients access to personalized cancer care through diagnostic testing. A tumor bank is maintained, where tissue is collected at time of surgery and stored for future use and testing if new diagnostic tests are developed. We routinely test a number of markers on tumor tissue to ensure accurate diagnosis and to determine if newer therapies will be effective.

Current Research Initiatives and Interests:

Phase II Phase III clinical trials in Gliomas: We currently offer clinical trials sponsored by the National Cancer Institute as well as by pharmaceutical companies. We are in collaboration with laboratories at UR to study the role of novel drug combinations of FDA approved drugs to treat glioblastoma.

Tumor Associated Epilepsy: This research program, led by Thomas Wyczolowski is dedicated to better understanding and predicting the development of epilepsy in brain tumor patients. Our research projects aim to devise a risk stratification score that will help us predict which brain tumor patients with the goal of decreasing seizures and patient’s symptoms.

Health Services Research in Glioblastoma: We maintain a prospecitive database of all patients with primary brain tumors to facilitate research projects. We are currently studying the impact of a palliative care intervention on patient outcomes, quality of life and caregiver quality of life. We have also completed studies assessing the cost of treatment and describing the burden of acute care utilization in glioblastoma. These projects are ongoing and have been led by medical student, Lauryn Hemminger and residents, Andrea Wasilevski and Benjamin George.

Telemedicine in Neuro-Oncology: In 2017, we will initiate a pilot of a telemedicine visits, led by Jennifer Serventi, for patients with glioblastoma in order to offer better access to patients in the southern tier.

Fellow and Faculty Alumni

Joohye Sul, MD Medical Offices, Brain and CNS Malignancies Scientific Liaison, Center for Drug Evaluation and Research, FDA

Joy Burke, MD Assistant Professor of Clinical Neurology, Division of Neuro-Oncology, URMC

Jennifer Mulbury Assistant Professor, Child Neurology, URMC

Adilia Hormigo, MD PhD Associate Professor of Neurology, Mt. Sinai Medical Center

Ajay Abad, MD Assistant Professor, Neurology, Roswell Park Cancer Institute

Faculty

Joy Burke MD
Robert Holloway MD, MPH
Ralph Jozefowicz MD
Davender Khra MD
Harold Lesser MD, PhD
Anthony Maroldo MD
Giovanni Schifitto MD
Michael Stanton MD
Raisa Villanueva MD, MPH

Nurse Practitioners:

Ann Ford Frickie NP
Gladys Hill RN

Nurse:

Ann Leitten NP

Major clinical and research interests:

The Division of General Neurology was initiated in 1989-90 by Dr. Randy Schiffer. Dr. Schiffer was recruited from psychiatry to neurology by Berch Griggs because of his interest in teaching plus his expertise in general neurology. Randy then designed what is now the general neurology resident clinic---an integrated “firm” that includes medical students, junior and senior neurology residents and an attending seeing patients from all socioeconomic backgrounds. Drs. Ralph Jozefowicz, David Goldblatt, and Richard Satran joined him. This flexible practice subsequently grew to include other faculty, both subspecialists and generalists, broadening the expertise within general neurology. The resident firms and “GNU” were housed in a newly-remodeled floor of the “U wing”.

In 1992-1993 Drs. Tim Counihan, Mike McQuillen and Richard Barbaro were recruited and the general neurology practice relocated to an of-fsite faculty practice at the Lattimore Road facility. EMG and EEG were added to a faculty that included Randy Schiffer, Dan Giang and Ralph Jozefowicz. The chief residents would spend one afternoon per week in the clinic as part of a “faculty practice” clinic experience. In the late 1990’s, the entire Lattimore Road operation moved to Clinton Crossings on Westfall Road. Eventually the Movement Disorder program and Epilepsy joined the Westfall operation. This opened up space for the outpatient department at Strong and the resident program moved to the first floor of the Ambulatory Care Building where they remain today.

When Bob Holloway was division chief for general neurology, Heidi Schwarz was recruited in 2003 from many years in private practice in general neurology to grow general neurology and establish a general neurology practice at Highland Hospital. In August 2004, Highland Neurology was established with Heidi Schwarz as chief and Garrett Riggs MD, PhD and James Celenia MBB as faculty members. Chief residents often did outpatient rotations at the office located in the Physician Office Building adjacent to Highland Hospital. Over the 6 years that Highland Neurology was operational, it was a prime location for many of the URMC Neurology residents to start their careers practicing general neurology including Jill Miller, Leslie Lee, Anthony Maroldo and Chris Burke. Highland Neurology was closed in 2010 but our residents and faculty continue to cover the inpatient service at Highland Hospital.

Anthony Maroldo and Heidi Schwarz then moved over to the Westfall office. Anthony Maroldo took on increasing responsibility in ambulatory operations in addition to broader responsibilities across the entire department. Raisa Villanueva joined general neurology in 2011 and Davender Khra joined in 2013. In January 2015, Harold Lesser joined the department after 20+ years in private practice in the community and his office location in Bushnell’s Basin has allowed for additional expansion of general neurology into the eastern region of Rochester.

By Raisa Villanueva MD, MPH, Division Chief
STROKE UNIT
By: Curtiss Benesch, MD, MPH

History
The Stroke Unit has grown considerably since its inception in 1996. Prior to that time, faculty members Dr. Richard Satran and Dr. Joshua Holland (RGH) had been participating in a few clinical trials in stroke prevention and were overseeing an outpatient stroke clinic. Dr. Benesch, inaugural and current Chief of the Stroke Unit, then expanded the number of clinical trials and began conducting weekly Stroke Rounds. A Stroke Consult service emerged, eventually leading to the consolidation of patients with stroke into a single geographic location (5-1600). By 1996, nearly all patients admitted to SMH were attended by Neurologists on the Stroke Service on 5-1600, rather than by non-neurologists on various units throughout the hospital. Early on, faculty members from across the department rotated through the Stroke Service, which became a separate inpatient service line, along with the General Neurology Service, in 1997. Drs. Griggs, Holloway, Barbano, Jozefowicz and Schiffer, along with Dr. Benesch, all served as attendings on the service in those early years. Fellowship-trained vascular neurologists Drs. Judith Hinchee, Scott Burdett and David Rempe joined the Unit between 1998 and 2003. Today, the Stroke Service is a robust clinical program staffed simultaneously with two Vascular Neurologists (Acute Stroke Service and Inpatient Attending), a fellow in Vascular Neurology, and an Inpatient Stroke Nurse Practitioner, along with the housestaff. Stroke Unit faculty and nurse practitioners also maintain a comprehensive outpatient practice, providing new patient consultations, hospital discharge follow-up evaluations and ultrasound services.

Strong Memorial Hospital was designated by the New York State Department of Health as a Primary Stroke Center in 2005, and was accredited by the Joint Commission as a PSC in 2006. The Stroke Unit has received the AHA Gold Award for quality performance every year since 2007, most recently being named to the Target Stroke Honor Roll for exemplary care of patients with acute stroke. Through collaborations across Endovascular Neurosurgery, Neuroradiology and Critical Care and Vascular Neurology, the University of Rochester Medical Center was accredited by the Joint Commission as a Comprehensive Stroke Center in 2014, and reaccredited in January 2016, joining the ranks of only 3 comprehensive stroke centers in New York State at the time. Dr. Benesch, surgical director of the CSC and Dr. Amarendra Mitropuri, Department of Neurosurgery, serves as medical director of the CSC.

Clinical Program
The Stroke Service admitted over 1100 patients with cerebrovascular disease in 2015, including over 800 patients with ischemic stroke, making it one of the largest programs in New York State. In combination with Endovascular Neurosurgery and Neuroradiology, Critical Care, the service provides acute stroke care, including intravenous thrombolysis and mechanical thrombectomy, diagnostic angiography, endovascular and neurosurgical techniques, and comprehensive critical care monitoring and treatment in a dedicated NICU (Debra Roberts, Director). The program has fostered seamless collaboration between EMS, Emergency Medicine, Imaging Sciences, Cardiology, Physical Medicine and Rehabilitation, Nursing, and restorative therapy in providing a comprehensive approach to each patient from the time of stroke onset to well beyond hospital discharge. Most recently, the Stroke Unit has teamed up with Neurosurgery, Imaging Sciences and Cardiology, to establish the Rapid Access TIA Clinic which provides urgent evaluations (~24 hours) for patients with transient ischemic attacks, including diagnostic studies: carotid ultrasound, echocardiography & MR imaging.

Research
The Stroke Unit has a long history of participation in clinical trials of acute stroke and stroke prevention, and is currently engaged in 8 active trials in cerebrovascular disease. Dr. Benesch (co-PI) recently completed a 4-year funded project (Stroke Treatment Alliance of Rochester—STAR) to establish a consortium of the 4 hospitals located in Rochester with goals of increasing the number of patients receiving acute interventions and improving adherence to secondary stroke prevention measures. Dr. Kelly focuses on end-of-life decision-making in stroke and management of severe stroke, and Dr. Holloway was the lead author on the recent guidelines for Palliative Care in Stroke. Dr. Halterman currently has 3 active grants exploring mechanisms of cerebral ischemic injury and potential treatments. Drs. Sahin and Busza are actively developing interests and investigative studies in stroke recovery.

Education
Stroke Unit faculty conduct teaching rounds every Monday-Thursday, present an annual lecture series in cerebrovascular disease, participate in an extensive fellowship training program (didactic lectures, journal clubs, clinical conferences), and of course, provide innumerable episodes of bedside teaching to students and residents on the clinical service.

The Fellowship in Vascular Neurology program is an ACGME-accredited program (since 2006) currently headed by Dr. Bogachan Sahin, with two slots available annually. Nine individuals have completed the program, several of whom subsequently joined the Stroke Unit Faculty. Dr. Sahin has recently enriched the program, with didactic lectures provided by faculty and external speakers, journal clubs, and clinical and research updates on Seminar Fridays, in addition to a vibrant clinical experience, with participation in both inpatient and outpatient vascular neurology, along with exposure to related fields and disciplines.

The Stroke Program also participates in the Fellowship for Experimental Therapeutics with four fellows completing the program (Drs. Benesch, Kelly, Joel May and Yi Zhang) since 1994. Dr. Aria Busza, recent graduate of the ACGME-accredited Vascular Neurology Fellowship, is a current fellow in the program.

Current Faculty and Staff:
Vascular Neurologists
Curtiss Benesch, MD, MPH
Unit Chief, Professor of Neurology and Neurosurgery: Dr. Benesch completed a fellowship in Experimental Therapeutics in Cerebrovascular Disease in 1994 and became Unit Chief in 1996. He is currently the Associate Chair for Clinical Affairs and Acute Neurological Services in the Department of Neurology, and Medical Director of the URMIC Comprehensive Stroke Center.

Adam Kelly, MD
Associate Professor of Neurology: Dr. Kelly completed his Vascular Neurology and Experimental Therapeutics Fellowships at the University of Rochester. He is currently Chief of Neurology and Stroke Center Director at Highland Hospital, and serves as Director of Clinical Research in the Unit.

Todd Holmquist, MD
Assistant Professor of Neurology and Imaging Sciences: Dr. Holmquist completed his Vascular Neurology Fellowship at the University of Rochester and is board-certified in Neurosonology. He currently serves as the Director of Ultrasonography in the Stroke Unit and oversees our Rapid Access TIA Clinic.

Bogachan Sahin, MD, PhD
Assistant Professor of Neurology: Dr. Sahin completed his Neurology Residency and Vascular Neurology Fellowship at Johns Hopkins University. He is currently the Program Director for the Vascular Neurology Fellowship. He has research interests in stroke treatment and stroke recovery, in particular in patients with visual field deficits.

Marc Halterman, MD, PhD
Associate Professor of Neurology: Dr. Halterman is a clinician-scientist with research interests in mechanisms of ischemic brain injury and novel treatments for stroke. He is also Associate Director of the MSTP Program.

Robert Holloway, MD, MPH
Professor of Neurology: Dr. Holloway is the current Chair of the Department of Neurology. He participates on the clinical service and, despite his many other obligations, he is a stroke neurologist at heart.

Neurohospitalists/Vascular Neurologists
Jeffery Burdett, MD, PhD
Assistant Professor of Neurology: Dr. Burdett completed his Vascular Neurology Fellowship at the University of Rochester before serving as Stroke Center Director at Rochester General Hospital. He is now Medical Director of 5-1600.

Mike Chilungu, MD
Assistant Professor of Neurology: Dr. Chilungu completed a fellowship in Clinical Electrophysiology before he served as neuro-hospitalist at Rochester General Hospital. He is now working as a neuro-hospitalist.
The NMICU service was founded in 2013 based on the vision of Robert Holloway MD, MPH, Chair of Neurology, Stephen Pichler, MD, PhD, Chair of Neurosurgery and Michael Apostolakos MD, Director of Adult Critical Care. Manjunath Makandaya, MD, MBBS became the first NMICU medical director and neurointensivist with Amrendra Miranpuri, MD serving as the surgical co-director. At that time the fledgling NMICU consisted of 8 dedicated beds within the Burn Trauma ICU, and was staffed by just 1 attending and 3 advanced practice providers (APPs). In June 2014 the NMICU moved to unit B12 with its own newly renovated, state-of-the-art 12 bed unit.

The NMICU Team

The NMICU team has grown substantially since inception. A second neurointensivist, Debra Roberts MD, PhD, joined the service in 2015 and took over as medical director later that year. Christopher Zamm, MD, who is trained in both Neuro ICU and Emergency Medicine, recently joined the program. He provides important perspective to bridge patient care from the ED to the ICU.

There are now 7 APPs who cover the unit 24/7. The APPs work closely with the NMICU nurses to ensure a high level of patient care, maintenance of communication with consulting teams and engagement of patients’ families. Our nurses play a key role within the NMICU. Our nurse-led rounds help engage all team members, facilitate documentation, and prevent errors. The NMICU is also fortunate to have a dedicated staff pharmacist, social worker, respiratory therapists, a nutritionist and rehabilitation specialists.

Clinical Practice

The NeuroMedicine team strives to provide the highest level care to critically ill patients with complex neurological and neurosurgical diseases. We specialize in the management of cerebral edema, intracranial hypertension, traumatic brain injury, acute ischemic stroke, intracranial hemorrhage, spinal cord injury, status epilepticus, and neuromuscular respiratory failure. Advanced level procedures and monitoring are performed by our team including intracranial pressure monitoring, pulmometry, endobronchial intubation and ventilator management, central venous catheterization, arterial line placement, bronchoscopy, diagnostic ultrasonography, cardiac output monitoring and targeted temperature management/therapeutic hypothermia. Olga Selioutski, DO, with the Strong Epilepsy Center, has worked tirelessly to develop our APPs neurocritical care knowledge base and is taught at a level appropriate to their needs. Topics covered include intracranial pressure management, mechanical ventilation techniques and the key concepts of neuroanatomy and physiology.

The NMICU faculty and staff have taken the lead in Emergency Neurological Life Support (ENLS) certification courses for UPMC residency programs and at regional hospitals. The goal of these courses is to improve patient care and outcomes during the first few hours after an acute neurological injury. Plans are underway to develop a NeuroCritical Care Fellowship program.

Quality Improvement and Research

The NMICU faculty and staff are devoted to patient safety and quality assurance. Our APPs and nursing staff are highly engaged in quality improvement projects and are encouraged to voice any concerns or opportunities to improve. We have started an “Every Better Board” to encourage staff input on safety and quality projects, and we review all mortalities monthly. Joint M&M conferences between the NMICU and the Stroke and Neurosurgery services stimulate collaboration and discussion. These conferences have led to guideline updates and the initiation of new protocols.

Research projects are ramping in the unit. We recently completed a trial testing a non-invasive intracranial pressure monitoring device and are awaiting the device’s FDA approval. A randomized controlled trial of treatment for super-refractory status epilepticus is currently underway. We are in the protocol development stage of an observational study to non-invasively monitor cerebral edema burden in stroke patients. Finally, we are doing a retrospective study of pupillometry for neurosurgical decision-making regarding the need for hemicraniectomy.
One of the department’s newest divisions, sleep medicine at the University of Rochester has benefitted from neurology’s strong clinical, educational, and research base. The division has blossomed into the premier regional program, and is gaining visibility on a national stage.

**History**

Although a sleep disorders program was not considered a division of neurology until the early 2000’s, no history of the discipline in Rochester would be complete without acknowledging Dr. Richard Satran. A founding member of the department, and a champion of the biopsychosocial model, Dr. Satran is the forefather of sleep medicine at the University of Rochester. Dr. Satran evaluated and managed patients with sleep disorders just over a decade after the first description of REM sleep as a distinct state. A 1982 Democrat and Chronicle article cited Dr. Satran as one of the only sleep specialists in the region.

Sleep in Rochester and elsewhere is a multidisciplinary specialty. The clinical field was advanced locally by pulmonologist Dr. Donald Greenblatt who started many of the regions’ clinical centers, and eventually founded the University’s first dedicated clinical sleep disorders practice in 2000. He was joined by another pulmonologist, Joe Modrak MD. Michael Perlis PhD and later Wilfred Pigeon PhD brought expertise from the psychiatry department. Neurology joined the division, primarily through the efforts of the late Dr. Kenneth Potkin who was recruited after completing residency and sleep training at Georgetown in 1998, and Dr. Lynn Liu from Duke in 2000. They worked closely with the pulmonologists, breaking through the traditional silos of academia, to develop a robust and vibrant multidisciplinary program.

Pediatric expertise was added in 2000, with Dr. Heidi Connolly, pediatric pulmonologist, as program director. This practice was initially located within the adult sleep center on South Clinton Avenue, but grew rapidly, and has moved twice in the past 10 years to accommodate the burgeoning patient need.

The development of sleep medicine in Rochester beyond primarily a clinical practice to a full-fledged academic endeavor has occurred in the past decade. Adult neurologists Dr. Michael Yurcheshen, recruited back from Michigan and Dr. Jonathan Marcus, and pediatric neurologist Dr. Laura Tomaselli have all joined the sleep program, and through their diligent efforts are moving the division forward to take advantage of educational and research strengths of the division.
Dr. Carolina Marcus, an allergist/immunologist from the Department of Medicine, has rounded out the division in the past year.

Sleep Disorders Center, Missions

Clinical Care

Regardless of which faculty members are staffing the sleep disorders center, patient care has been at the center of the mission. This emphasis has expanded since many other private practice centers in Western New York are contracting or closing. Patients are referred to the UR Medicine Sleep Center from Rochester, the Southern Tier, Syracuse, and beyond. The multidisciplinary team approach has been a successful model for balanced patient care, and the cadre of skills provided by our neurologists and others has led to the program's success. Although the most common referrals are for evaluation and management for obstructive sleep apnea and insomnia, the program manages unusual and rare cases including narcolepsy, parasomnias, and primary hypersomnia. The pediatric sleep center is particularly well-known as the only such program between Cleveland and New York City. With the relationship between sleep disorders and other disease states, neurologic and otherwise, the demand for clinical services continues to grow.

Education

Once our multispecialty program was established, our training program has led the program to distinction. One of only 72 such training programs in the country, the sleep medicine fellowship was developed under the well-established neurology education umbrella. Mike Yurcheshen has served as the program's director since its inception in 2003. Since then, the program has trained pulmonologists, pediatricians, neurologists, family medicine physicians, and otolaryngologists in sleep medicine. Our trainees have assumed positions in both private practice and academia nationwide. Because of the diverse faculty body, other fellowship programs routinely mandate rotations in Rochester to benefit from the faculty's expertise, particularly in the pediatric sleep center. In addition to formal fellowship training, the sleep center has accommodated scores of fellows, residents, and medical students on elective from the University of Rochester's other training programs. Since 2003, nine graduates from our adult and pediatric neurology programs have gone on to formally train in sleep medicine fellowships, either in Rochester or across the country.

Research

Our most aspirational goals include further buttressing and development of basic science, translational, and clinical research in the fields of sleep medicine and circadian sciences. In addition to Dr. Pigeon's ongoing work, other faculty members have advanced these initiatives. Maiken Nedergran MD, D.M.Sc, affected a worldwide paradigm shift with her 2013 publication regarding the glycylam system and its importance in the functionality of sleep. Michael Sela PhD is a recent appointee in the endocrinology division of the Department of Medicine and is the university's first chronobiologist, studying circadian rhythm and its impact on metabolic disease. Other research projects include the role of sleep disorders breathing in susceptibility in military veterans, pediatric sleep and the control of ADHD, and biomarker studies in patients with parasomnias at risk for neurodegenerative conditions.

Neurology Faculty

Harris A. Gelbard, M.D., Ph.D.
Matthew J. Bellizzi, M.D., Ph.D.
Marc W. Halterman, M.D., Ph.D.
Shao-Ming (Pat) Lu, Ph.D.
Alexander R. Paciorkowski, M.D.
Zhenzhi Tang, Ph.D.
Ning Tong, B.Med., Ph.D.
Charles A. Thornton, M.D.

Secondary Faculty

Sina Ghaemmaghami, Ph.D. (Biology)
Gail V.W. Johnson, Ph.D. (Anesthesiology, Pharmacology & Physiology)

Faculty Appointed in Other Departments

Douglas S. Portman, PhD. (Biomedical Genetics, Biology, Neuroscience)
Rupal I. Mehta, M.D. (Pathology and Laboratory Medicine, Neuroscience)

Professor Emeritus

Paul D. Coleman, Ph.D.

Adjunct Faculty

William J. Bowers, Ph.D.

The Center for Neural Development and Disease (CNDD), soon to be renamed as the Center for Neurotherapeutics Discovery (CNDD), grew out of the Center for Aging and Developmental Biology (CABD), founded by Howard J. Federoff in 1999. Harris ("Handy") A. Gelbard, from the Division of Child Neurology was invited to be one of the original members in 1999. In 2007, after Dr. Federoff had accepted a position as CEO of Georgetown University Medical Center, Dr. Gelbard became the interim director of CABD, until renaming it the CNDD in 2008. Since that time, Dr. Gelbard's initial 5-year appointment as the Director has been renewed until 2018. CNDD has had a multidisciplinary, cross-department constituency, with members from Biology, Biomedical Genetics, Neurosurgery, Pathology and Laboratory Medicine, as well as Neurology. The core Neurology faculty that now comprise CNDD include Matthew ("Matt") J. Bellizzi, Harris A. Gelbard, Marc W. Halterman, Alexander R. Paciorkowski and Charles A. Thornton.

Dr. Bellizzi, a member of the Gelbard laboratory, has an interest in hippocampal and cortical synaptopathies that occur during multiple sclerosis (MS) and progress independently of current immunomodulatory therapies. His research is currently focused on prevention and reversal of synaptic damage using receptor antagonists for platelet-activating factor and mixed lineage kinase inhibitors developed in Dr. Gelbard's lab. Dr. Halterman's research program focuses on hypoxia and stroke, with a therapeutics program that targets development of novel tetracycline compounds. Dr. Halterman has had a strong focus on bioinformatics, developing tools for screening novel drug targets and pathway analyses in the CNS, relevant to his stroke therapeutics program. Dr. Gelbard's research, while largely focused on HIV-1 associated neurocognitive disorders (HAND), has been responsible for the discovery and development of over 200 compounds, including a lead candidate, URM099 that is a "selectively non-selective" inhibitor of mixed lineage kinase type 3 (MLK3). URM099, and its congeners are protected by three national and international patents, and have proven utility in models of post-operative cognitive dysfunction (POCD), MS, Alzheimer's disease (AD), eradication strategies for HIV-1, non-alcoholic steatohepatitis (NASH) and ischemia-reperfusion injury and myocardial infarction. URM099 is in clinical development for several indications, including POCD, MS and HAND, with a newly formed company, WaveDyne Therapeutics. Dr. Gelbard serves as the head of the scientific advisory board. Dr. Paciorkowski, a pediatric neuropathologist and neurogeneticist, uses next generation sequencing approaches for gene discovery in severe developmental epilepsies such as Dravet Syndrome and treat the molecular events that lead to phenotypic expression of the epileptic encephalopathies. Dr. Thornton's research has focused on the molecular pathogenesis of myotonic dystrophy, with the creation of several paradigm-shifting models for the disease and an entirely new approach to therapy using antiserine diacylglycerolides.

By: Harris A. Gelbard, M.D., Ph.D., Director
The Center for Translational Neuromedicine was established in 2007 as a joint enterprise of URMC’s departments of Neurology and Neurosurgery. It was formed from the merger of clinical school a few years earlier. In the years since its formation, it has evolved into one of the most productive centers for basic and early stage translational neuroscience in the US. The principal groups in the Center include Dr. Goldman’s, whose division focuses on astrocytic physiology and the translational application thereof, and Dr. Nedergaard’s, whose division focuses on astrocytic physiology and pathology, as well as on cerebral blood flow and its giall regulation. Together, the labs are expanding the scope of giall biology, such that disorders long thought neuronal in nature are now being investigated as disorders principally of giall cells, including both astrocytes and oligodendrocytes as well as their progenitors.

Goldman Lab (Division of Cell & Gene Therapy)
- Giall progenitor-based cell therapy in myelin disease: pediatric leukodystrophies & progressive MS
- Giall replacement and induced neurogenesis as treatments for Huntington Disease
- Use of human iPSC and ES cell-derived neural and giall progenitors for modeling neuropsychiatric diseases, including schizophrenia and frontotemporal dementia
- Transcriptional architecture and modulation thereof of human neural and giall progenitor cells
- Identifying selectively expressed targetable pathways in glioma stem cells of the adult CNS

Nedergaard Lab (Division of Glial Therapeutics)
- Mechanisms of CSF clearance and fluid homeostasis in both normal and injured CNS
- The role of astrocytes in epileptogenesis and the treatment of secure disorders, especially post-stroke
- Therapeutic targeting of neuronal-astrocytic interactions in stroke and traumatic brain injury
- Developing new modalities for imaging native and transplanted giall progenitors in vivo
- The role of astrocytes in the regulation of sleep & arousal
- The evolutionary biology of astrocytes
- Imaging of fluid flow and convection in the adult brain

International reach: In 2014, the Center opened a new laboratory in the University of Copenhagen Faculty of Medicine in Denmark, as the Center for Basic and Translational Neuroscience. This new department is supported by several dozen national and international grants, with current funding commitments approaching $50 million. Past and present pharmaceutical collaborators include Biogen Idec, Sanofi and Merck, as well as QThera and Healios, advancing the translational scope of these studies. The Center has enjoyed consistent productivity, and is one of the most well-recognized in American neuroscience; in the last 3 years alone, the Center’s research has appeared in Science, Science Translational Medicine, Science Signaling, Cell, Cancer Cell, Cell Stem Cell, Developmental Cell, Development, Nature Medicine, Nature Biotechnology, Nature Neuroscience, Nature Communications, the Journal of Clinical Investigation, Proceedings of the National Academy of Sciences, the Journal of Neuroscience, Neurotherapeutics, Annals of Neurology, Glia, Experimental Neurology, Scientific American, and others.

Structure and track record: At Rochester, the Center now (July, 2106) includes over 70 faculty, postdoctoral fellows, technical associates, administrative staff, and students. In addition, the Copenhagen lab now includes over 40 faculty, postdocs, students and staff, for a total census of 110 scientists, including basic and translational neuroscientists alike. The labs are highly collaborative, with many students and fellows working with several faculty. The group’s work is supported by several dozen national and international grants, with current funding commitments approaching $50 million. Past and present pharmaceutical collaborators include Biogen Idec, Sanofi and Merck, as well as QThera and Healios, advancing the translational scope of these studies. The Center has enjoyed consistent productivity, and is one of the most well-recognized in American neuroscience; in the last 3 years alone, the Center’s research has appeared in Science, Science Translational Medicine, Science Signaling, Cell, Cancer Cell, Cell Stem Cell, Developmental Cell, Development, Nature Medicine, Nature Biotechnology, Nature Neuroscience, Nature Communications, the Journal of Clinical Investigation, Proceedings of the National Academy of Sciences, the Journal of Neuroscience, Neurotherapeutics, Annals of Neurology, Glia, Experimental Neurology, Scientific American, and others.
In 1987, the Center for Human Experimental Therapeutics had its origins in the formation of the Coordination and Data Center (‘CDC’) founded by Dr. Ira Shoulson in response to an operational need to manage the large, NIH-sponsored DATATOP (Deprenyl and Tocopherol Antioxidative Therapy of Parkinsonism) clinical trial. The DATATOP trial recruited 800 participants from 28 academic research centers across the US and Canada. All study operations were conducted by 6 ‘CDC’ employees via telephone, fax, and postal mail out of offices located in the Town House building (recently demolished in the construction of College Town). Dr. Shoulson also initiated the formal assembly of the participating academic institutions into the Parkinson Study Group, which was also administratively housed at the ‘CDC’, and is now the largest not-for-profit scientific network of Parkinson, Huntington, and HIV disease in partnership with the NIH, foundations, and industry. In 2000, the CDC converted from a paper-based study document management system to an electronic clinical trials management system. This process required vendor selection, infrastructure upgrading, staff and investigator training, internal auditing to assure compliance with federal regulations, and roll out to clinical trial sites. The CTCC maintained quality operations throughout the process and, between 1997 and 2015, the CTCC has been instrumental in conducting pivotal clinical trials in support of FDA approval for four novel, symptomatic therapies for Parkinson disease (pramipexole, entacapone, rasagiline, and rotigotine), one for Huntington disease (tetrabenazine), and recently, one for Friedreich’s Ataxia may receive FDA approval in the next year.

In 1991 the CDC was re-named the Clinical Trials Coordination Center (CTCC), and Dr. Karl Kieburtz was named the director. Over the next 18 years, as a unit in the Neurology Department, the CTCC assisted in the design and conduct of multi-center randomized controlled trials for Parkinson, Huntington, and HIV disease in partnership with the NIH, foundations, and industry. In 2003, the CTCC was re-named the Clinical Trials Coordinating Center (CTCC), and Dr. Karl Kieburtz served as the director. Over the next 18 years, as a unit in the Neurology Department, the CTCC assisted in the design and conduct of multi-center randomized controlled trials for Parkinson, Huntington, and HIV disease in partnership with the NIH, foundations, and industry. In 2003, the CTCC converted from a paper-based study document management system to an electronic clinical trials management system. This process required vendor selection, infrastructure upgrading, staff and investigator training, internal auditing to assure compliance with federal regulations, and roll out to clinical trial sites. The CTCC maintained quality operations throughout the process and, between 1997 and 2015, the CTCC has been instrumental in conducting pivotal clinical trials in support of FDA approval for four novel, symptomatic therapies for Parkinson disease (pramipexole, entacapone, rasagiline, and rotigotine), one for Huntington disease (tetrabenazine), and recently, one for Friedreich’s Ataxia may receive FDA approval in the next year.

In 2008, the Clinical Materials Services Unit (CMSU) was created in response to a growing URMC need for a dedicated, regulatory-compliant facility, operating under current Good Manufacturing Practices (GMP) to provide all investigational drug/device packaging, labeling, distribution, and return services for the many large, multi-center, multi-year clinical trials being conducted by URMC. The CMSU currently occupies 8,000 sq. ft. of CGMP compliant space located at 77 Ridgeland Rd., Rochester, NY. In 2008, the Clinical Materials Services Unit (CMSU) was created in response to a growing URMC need for a dedicated, regulatory-compliant facility, operating under current Good Manufacturing Practices (GMP) to provide all investigational drug/device packaging, labeling, distribution, and return services for the many large, multi-center, multi-year clinical trials being conducted by URMC. The CMSU currently occupies 8,000 sq. ft. of CGMP compliant space located at 77 Ridgeland Rd., Rochester, NY. In 2008, the Clinical Materials Services Unit (CMSU) was created in response to a growing URMC need for a dedicated, regulatory-compliant facility, operating under current Good Manufacturing Practices (GMP) to provide all investigational drug/device packaging, labeling, distribution, and return services for the many large, multi-center, multi-year clinical trials being conducted by URMC. The CMSU currently occupies 8,000 sq. ft. of CGMP compliant space located at 77 Ridgeland Rd., Rochester, NY.

In 2011, URMC announced the creation of a new, 30,000 sq. ft. state-of-the-art clinical trials facility, the Clinical Trials Center (CTC). The CTC is a not-for-profit, dedicated, multi-center, multi-disciplinary clinical trials center. The CTC is located at 228 Ridgeland Rd., Rochester, NY. The CTC is a not-for-profit, dedicated, multi-center, multi-disciplinary clinical trials center. The CTC is located at 228 Ridgeland Rd., Rochester, NY. The CTC is a not-for-profit, dedicated, multi-center, multi-disciplinary clinical trials center. The CTC is located at 228 Ridgeland Rd., Rochester, NY. The CTC is a not-for-profit, dedicated, multi-center, multi-disciplinary clinical trials center. The CTC is located at 228 Ridgeland Rd., Rochester, NY.

In 2009, Dr. Kieburtz, with the support of the UR medical school Dean and UR Medical Center CEO, created the Center for Human Experimental Therapeutics (CHET). CHET was designed to provide guidance and assistance to University investigators who wished to conduct human clinical investigation. In keeping with this multi-disciplinary role, the CHET faculty and staff offices were re-located to the newly-constructed Saunders Research Building in 2011. CHET supports the mission of the CTSI in several ways: 1) providing consultative services to academic investigators with regard to clinical study design and operations, 2) developing tools and technologies for 21st century clinical trials, and 3) fostering external relationships with researchers and drug developers.

To date, CHET has conducted 120 clinical trials, enrolled 39,000 participants from sites across North America, Europe and Australia, and partnered with over 80 cross-sector collaborators and sponsors (e.g. academic study groups, federal agencies, pharmaceutical industry, and private foundations) (see Figure 1), resulting in over 350 publications in leading journals, such as Lancet, Neurology and JAMA, and 33 FDA-approved treatments (see Table 1 above). In the field of neurology, the operational capacity of CHET was fully implemented in the conduct and support of the largest clinical trials for Parkinson disease (NINDS Exploratory Trials in Parkinson Disease Long-term Study 1 (NET-PD LST1)) and Huntington disease (Creative Safety, Tolerability, & Efficacy in Huntington’s Disease [CREST-4] and Coenzyme Q10 in Huntington’s...
of the Department of Neurology’s Experimental Therapeutics Fellows who went on to careers within the University, at numerous other institutions and private companies across the country. Fellows included: Karl Kieburtz, Robert Holloway, Fred Marshall, Giovanni Schifitto, Steve Schwid, Irene Richard, Andrew Siderowf, Karen Blindauer, David Song, Penelope Hogarth, Lin Zhang, Joy de Marcada, Tom Gustuso, Kevin Biglan, Sam Frank, Chris Hyson, Ray Dorsey, Tiffini Voss, Erika Auguste, Ryan Evans, Andrew McGarry, Charles Venuto, and Abeer Abu-Zeltone.

Looking to the Horizon:

In 2014, Dr. Ray Dorsey assumed leadership of CHET and immediately expanded the vision of its research program to be one that would enable anyone anywhere to receive care, participate in research, and benefit from its advancements. This vision builds upon the strong foundation in the design and conduct of traditional clinical trials, but seeks to incorporate evaluation of ground-breaking research in the fields of telehealth (e.g. video conferencing and smartphone technology) and wearable sensors as a means to increase access to care (telemedicine) and accelerate clinical research. These pursuits, which include the first national randomized controlled trial of telerehabilitation for Parkinson disease, have received support from the Patient-Centered Outcomes Research Institute and NIH, as well as early interest from the pharmaceutical industry.

In addition, through the leadership of Dr. Gretchen Birbeck, CHET’s efforts have begun to expand to Africa to support clinical investigations of important treatments for cerebral malaria. These efforts are poised for greater growth in the future.

Over the past generation, CHET has re-shaped the conduct of clinical research and has advanced knowledge to improve health for millions, if not billions, of individuals. What began as a Coordination and Data Center that served a single clinical trial, has evolved to an international, multi-faceted research and operations center, which has redefined how academic institutions can conduct rigorous clinical investigation on a global scale and is leading the field in evaluation of how to harness the tools and technologies of the early 21st century to extend the reach and impact of research and clinical care beyond what was previously possible.

As early as the mid-1970’s, the Rochester Department of Neurology challenged the therapeutic nihilism of most neurology departments and neurologists, recruiting and supporting a generation of leaders focused on experimental therapeutics: first in neuromuscular diseases, then movement disorders and stroke, followed by multiple sclerosis/neuromyelitis, HIV-neurology, epilepsy and other sub specialties. As fellowship programs began to develop within the department, faculty leaders (Dr. Shoulson and Birch Griggs) enlisted the help of biostatisticians to train residents and fellows in the skills essential to developing, supporting and conducting clinical trials.

The department’s training program began officially with the acceptance of Karl Kieburtz as the inaugural fellow in 1989. The initial submission of a T32 grant to the NINDS merited a written undying report that indicated that “no one goes into neurology to treat patients,” but an enthusiastic minority report that applauded the notion of developing novel treatments for neurological diseases. The resubmission argued that neurotherapeutics was the future of neurology and was funded for 4 slots in 1990. Since most trainees remain in the program for 2-3 years, this funding enabled us to recruit an average of 2-3 trainees per year. The program has successfully competed for funding in 1995, 2000, 2005, 2010 and 2015 --- with the most recent renewal extending through 2020. We have also been successful at securing supplements to fund additional fellows on 4 occasions. Initially the NINDS did not encourage the inclusion of non-NINDS funded trainees in the program. However, the program has always insisted that the ideal training strategy is for fellows to seek alternative funding --- and if successful, the program can accept additional fellows. Recently, the NINDS has recognized that it is important to support program recruits, supports and train additional fellows and encouraged us to do just that. Since the beginning, the program has also accepted trainees without a MMSc/cardiology/cardiovascular medicine card status --- and ineligible for T32 support. Highly talented individuals from the U.K., Italy, Canada, Thailand, China as well as US-trained residents who are foreign nationals have received training. In addition, many trainees have been supported by other federal and non-federal monies. Over 90% of trainees have been post-residency neurologists. In addition, the program has trained clinical neuroscientists with other backgrounds: neuropsychology, psychiatry, pharmacology, emergency medicine, statistics, pediatrics.

Program Structure and Goals: The program trains post-residency fellows for a career in clinical neuroscience with a focus on experimental therapeutics including: (1) conceptual, design, implementation, analysis, reporting and ethics of controlled clinical trials; (2) investigation of pathomechanisms and natural history of disease; (3) discovery of promising therapeutic agents; (4) examination of clinical biomarkers that help clarify therapeutic mechanisms and have the potential to serve as surrogate end points; (5) integration of potential treatments into clinical care by cost/benefit analyses, outcomes research, and health care economic considerations; (6) identification, recruitment, retention and longitudinal investigation of research subjects; and (7) mentored development of research proposals for extramural funding. The program has been strengthened by the Departments of Biostatistics, Psychiatry, Public Health Sciences, and Pharmacology and Physiology, and three interdepartmental centers: The Center for Translational Neuromedicine, the Neural Development and Disease Center, and the Center for Human Experimental Therapeutics.

Participating Faculty Members: The program directors and assistant fellowship director are joined by 18 mentors to create an interactive and collegial program that participates in activities with the trainees, and has numerous ongoing research collaborations.

Training is highly individualized but trainees participate in program seminars and establish a mentoring team to foster their success. The mentoring team is fundamental to the infrastructure of the training program. Each trainee works with a team that includes a clinical neuroscientist and a biostatistician and they are responsible for the trainee’s program and development. The trainee and a specific single mentor agree early in the training on a long-term mentorship relationship. A basic neuroscientist/mentor also guides the development of the trainee in appropriate focused areas of basic neuroscience. The Working Group on Therapeutic Trials (established in 1988 by Drs. Griggs and McDermott and now Co-Directed by Drs. Dwarkin and Busch) has met between 1-2 times a month since October 1988. Attended by all trainees and mentors, the Working Group provides an interactive forum for: (1) review and
critique of planned clinical trials; (2) presentation of statistical design for controlled trial; (3) review of preliminary results; (4) discussion of pilot data and idea-generation for future studies; (5) review of trainee proposals; (6) presentations by visiting clinicians.

Mellow fellows, co-led by Drs. Kieburz and McDermott, is a monthly meeting of fellows and mentors that has focused on issues of clinical trials and trainees' early plans for research projects. The meetings provide for a presentation of ideas and preliminary plans followed (and often interrupted by) a free-wheeling and far-reaching discussion of goals, issues, methods, practical limitations and ideas ranging from design and patient recruitment to funding and publication strategies. These sessions have forged collaboration, spawned projects, facilitated recruitment of trainees, and provided mentoring opportunities often lacking in more formal gatherings. The Interfaces Between Clinical and Research Careers during their clinical training. Current and accepted fellows are all have accepted fellows focused on experimental therapeutics who will begin to develop their research careers. They recommended that the program explore initiating research training in both AGMGE- and UCN-approved specialty training programs. In response to this recommendation Stroke, Neurovascular Disease and Sleep all have accepted fellows focused on experimental therapeutics training who will begin to develop their research careers during their clinical training. Current and accepted trainees include: Ania Buza, Christopher Taroli, Andrew (Trey) Smith, Trisham Gyang, Jennifer Cialone, Shannon Dean, Johanna Hamel, Peter Creigh and Alex Frickie.

The program has trained over 60 fellows who now have positions around the U.S. and throughout the world. The program has defined “success” broadly: academic positions, pharmaceutical industry leadership, and positions at the FDA, NIH or other Federal institutions. (See table) Currently there are seven trainees in the program and we anticipate that there will be ten trainees in 2017-18. At the time of the 5-year review of the program in 2013, the site visitors noted that the proliferation of subspecialty certification in neurology delayed the ability of post-residency clinical neuroscientists to get started on their research careers. They recommended that the program explore initiating research training in both AGMGE and UCNs-approved specialty training programs. In response to this recommendation Stroke, Neurovascular Disease and Sleep all have accepted fellows focused on experimental therapeutic training who will begin to develop their research careers during their clinical training. Current and accepted trainees include: Ania Buza, Christopher Taroli, Andrew (Trey) Smith, Trisham Gyang, Jennifer Cialone, Shannon Dean, Johanna Hamel, Peter Creigh and Alex Frickie.

### Trainees in Experimental Therapeutics

<table>
<thead>
<tr>
<th>Fellow Name</th>
<th>Year(s)</th>
<th>Specialty/Subspecialty</th>
<th>Current Location</th>
<th>Current Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christophor O'Brien, MD</td>
<td>1989-91</td>
<td>Movement</td>
<td>Movement Neuroscience</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Sveti Kieburz, MD*</td>
<td>1993-94</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Professor</td>
</tr>
<tr>
<td>Charles Thornton, MD*</td>
<td>1991-93</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>Professor</td>
</tr>
<tr>
<td>Carla Benezech, MD, MPH*</td>
<td>1992-94</td>
<td>Stroke</td>
<td>U of Rochester</td>
<td>Professor</td>
</tr>
<tr>
<td>Andrew Fajul, MD*</td>
<td>1995-96</td>
<td>Movement</td>
<td>Feinberg Inst Medical Research</td>
<td>Professor</td>
</tr>
<tr>
<td>Richard Wilmsmuth, MD</td>
<td>1996-97</td>
<td>Movement</td>
<td>Feinberg Inst</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Nerey Regal, MD</td>
<td>1994-95</td>
<td>Epidemiology</td>
<td>Epidemiology</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Frederick Marshall, MD</td>
<td>1994-95</td>
<td>Movement/Centri</td>
<td>U of Rochester</td>
<td>Professor</td>
</tr>
<tr>
<td>Steven Schwartz, MD*</td>
<td>1994-96</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>Observist</td>
</tr>
<tr>
<td>David Finkelnstein, MD*</td>
<td>1995-96</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Professor</td>
</tr>
<tr>
<td>Ame Richard, MD*</td>
<td>1996-97</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Professor</td>
</tr>
<tr>
<td>Glen Ullon, MD*</td>
<td>1996-97</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>Professor</td>
</tr>
<tr>
<td>Andrew Stefanov, MD*</td>
<td>1998-98</td>
<td>Movement</td>
<td>Andro Radio P. J.</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Niurupu Lario</td>
<td>1997-98</td>
<td>Pediatrics</td>
<td>U of Rochester</td>
<td>Professor</td>
</tr>
<tr>
<td>Karen Blundauer, MD*</td>
<td>1997-99</td>
<td>Movement</td>
<td>Medical College of WI</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>David Song, MD* PhD*</td>
<td>1997-99</td>
<td>Movement</td>
<td>U of San Diego</td>
<td>Associate Professor</td>
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<tr>
<td>Pemelise Hogarth, MD*</td>
<td>1998-00</td>
<td>Movement</td>
<td>Oregon Health Sciences U</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>John Zhang, MD* PhD*</td>
<td>1998-00</td>
<td>Movement</td>
<td>Oregon Health Sciences U</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>J. Antonukle deMarssaia, MD</td>
<td>1998-01</td>
<td>Movement</td>
<td>Movement Disorders U</td>
<td>Director</td>
</tr>
<tr>
<td>Jeffrey Campbell, MD*</td>
<td>1999-00</td>
<td>Neurosurgery</td>
<td>Movement Disorders U</td>
<td>Director</td>
</tr>
<tr>
<td>David Marcus, MD*</td>
<td>1999-00</td>
<td>Movement</td>
<td>Movement Disorders U</td>
<td>Director</td>
</tr>
<tr>
<td>Kevin Rijani, MD*</td>
<td>2000-03</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Professor</td>
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<tr>
<td>Thomas Satozuko, MD*</td>
<td>2000-03</td>
<td>Movement</td>
<td>U of Buffalo</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Mark Mgabgul, PhD*</td>
<td>2001-03</td>
<td>Cognitive/Behavioral</td>
<td>U of Irving</td>
<td>Professor</td>
</tr>
<tr>
<td>Joseph Rigo, MD*</td>
<td>2001-04</td>
<td>Cognitive/Behavioral</td>
<td>Central Florida Orlando</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Samuel Frank, MD*</td>
<td>2002-03</td>
<td>Cognitive/Behavioral</td>
<td>Beth Israel Boston</td>
<td>Professor</td>
</tr>
<tr>
<td>Michelle Weber, PhD*</td>
<td>2003-06</td>
<td>Cognitive/Behavioral</td>
<td>U of Rochester</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Louis Polieno, MD, PhD*</td>
<td>2003-06</td>
<td>Psychiatric</td>
<td>Psychiatry</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Richard Langlo, MD*</td>
<td>2004-06</td>
<td>Movement</td>
<td>Seattle WA</td>
<td>Private Practice</td>
</tr>
<tr>
<td>Liis Hurn*</td>
<td>2004-06</td>
<td>Stroke/Regulatory Med</td>
<td>U of Rochester</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Hill Miller, MD, PhD*</td>
<td>2004-06</td>
<td>Neuroimmunology</td>
<td>Melbourne FL</td>
<td>Private Practice</td>
</tr>
<tr>
<td>Patr Jolly, MD, MBA*</td>
<td>2004-06</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>David Gill, MD*</td>
<td>2005-07</td>
<td>Cognitive/Behavioral</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Chad Halfacree, MD*</td>
<td>2006-08</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Tiffany Vosa, MD*</td>
<td>2007-09</td>
<td>Movement</td>
<td>Merck Research Laboratories</td>
<td>Director, Clinical Neuroscie</td>
</tr>
<tr>
<td>David Stropecehe, DO*</td>
<td>2007-09</td>
<td>Movement</td>
<td>BrainHealth, U of Iowa</td>
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<tr>
<td>Amy Lindman, MD*</td>
<td>2007-09</td>
<td>Neuroimmunology</td>
<td>Arizona</td>
<td>Director</td>
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<tr>
<td>Adam Kelly, MD*</td>
<td>2007-09</td>
<td>Stroke</td>
<td>U of Rochester</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Iloka Kugut*</td>
<td>2008-09</td>
<td>Pediatric Neurology</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Ryan Evans, MD*</td>
<td>2008-10</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Andrew McClairry, MD*</td>
<td>2008-10</td>
<td>Movement</td>
<td>Cooper U Hospital</td>
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<tr>
<td>Song Ke, MD, PhD*</td>
<td>2008-11</td>
<td>Neuroimmunology</td>
<td>Changhai U</td>
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<tr>
<td>Anna Papezarian, MD*</td>
<td>2008-11</td>
<td>Neuroimmunology</td>
<td>Pittsburgh Medical Center</td>
<td>Assistant Professor</td>
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<tr>
<td>Jeffrey Stallard, MD*</td>
<td>2010-10</td>
<td>Neuroimmunology</td>
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<tr>
<td>Charles Venuto, PharmD*</td>
<td>2010-10</td>
<td>Neuroimmunology</td>
<td>U Rochester</td>
<td>Assistant Professor</td>
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<td>Amy Aronin, MD*</td>
<td>2010-11</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Matthew Bethz*</td>
<td>2010-13</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<td>Jo Myo, MD*</td>
<td>2011-13</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Nichole Johnson, PhD*</td>
<td>2011-13</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<td>Rachel Bentsker, MD*</td>
<td>2013-15</td>
<td>Movement</td>
<td>Gunderson Health System WI</td>
<td>Assistant Professor</td>
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<tr>
<td>Lauren Riddle, MD*</td>
<td>2013-15</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Kelly Andriewski, MD*</td>
<td>2014-16</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Mary Akersolane, PhD*</td>
<td>2014-16</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Andrew Smith III, MD*</td>
<td>2014-17</td>
<td>Neuroimmunology</td>
<td>U of Rochester</td>
<td>In training</td>
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<tr>
<td>Anne Buzi, MD* PhD*</td>
<td>2015-16</td>
<td>Stroke</td>
<td>U of Rochester</td>
<td>In training</td>
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<td>Christopher Taroli, MD*</td>
<td>2015-16</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>In training</td>
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<tr>
<td>Anne Wexler, MD*</td>
<td>2015-16</td>
<td>Pediatric Neurology</td>
<td>Noran Neurological Clinic</td>
<td>Private Practice</td>
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<tr>
<td>Christopher Lamska*</td>
<td>2016-17</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Christopher Siderowf, MD*</td>
<td>2016-17</td>
<td>Movement</td>
<td>U of Rochester</td>
<td>Assistant Professor</td>
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<tr>
<td>Kelly Lea Bradley*</td>
<td>2016-17</td>
<td>Pediatric Neurology</td>
<td>Medical University of South Carolina</td>
<td>Assistant Professor</td>
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The tripartite missions of the Department of Neurology continue in great force under the leadership of Central Administration. Our clinical, teaching and research enterprise has grown to over $61.3 million in revenue and international recognition of our teaching and research programs. This growth and success reflects our dedicated faculty and the administrative team that supports their work.

The department is organized into thirteen divisions, and managed through a central administrative structure. The role of the Department Administrator has seen some evolution in its leadership. Sadly, Virginia Wesołowski left the department in 2010 after 12 years of service. Dr. Goldman then promoted Anthony Bederman into the role after serving in Neurology Research Administration from 2009 through 2010. With research administration as his calling, Anthony accepted a position in the Office of Research and Project Administration in January 2011. Anne Dickinson then took the reins for a short time in 2012. In January, 2013 the current Chair, Dr. Robert Holloway, recruited Christine Miller to be Department Administrator. During her tenure, she has strengthened the core structure of Central Administration by adding the new positions of Director of Acute Care Divisions, Christina Clary and Director of Divisional Operations, Lee Albert.

Research and Finance have been consolidated under the leadership of Sara Uschold. With a team of two research administrators, Emily Adams and Libby McClung, two research accountants, Allison Fess and Matt Taber, we are able to effectively manage our growing research enterprise. Chris Annis, Senior Health Project and NeuroNext Coordinator, actively supports many of our Principal Investigators and the Chair and Department Administrator. Brittney serves as Clara Vigelette with the residency program as well as providing support for the Chair’s office. Our residency and fellowship programs continue to thrive under the administrative leadership of Clara Vigelette. Sadly, in May of 2014, we lost Nancy Benjamin after her courageous battle with cancer. New beginnings brought Lore Wolflinger to residency administration, as the Medical Student Clerkship Coordinator and support to Dr. Ralph Jozefowicz. Magda Ranzay acts as the Residency Coordinator of Child Neurology.

The clinical arm of our department is managed by Tim Kehl, Nurse Manager, and Rosanne Cannarozzo, Practice Administrator. Our clinical business has seen tremendous growth and continues to evolve with the formation of the Neurology Access Center. Under the leadership of Tracy Kenney, this group manages all incoming calls to the department providing scheduling of appointments and triaging of patient calls to clinical providers. Our clinic footprint has grown with the addition of our combined Neurology and Neurosurgery Stroke clinic at 2180 South Clinton and an additional suite of over 9000 square feet of clinical space at 919 Westfall Rd. In early 2017, our Child Neurology clinic will move to a new state-of-the-art building on East River Road. Additionally, in January of 2014, Neurology acquired its first private practice in Bushnell’s Basin.

Karen Calabro continues to oversee our billing team and is a standout for her skills both in her management and performance metrics. Due to this success, she was recently asked to oversee the billing administration for the Department of Ophthalmology. Karen has been a pioneer in the restructuring of her team to effectively manage coding, charge entry and collections.

Tina Walsh was a new addition in 2016 as Human Resources Business Partner to both Neurology and Neurosurgery. She has brought a breath of fresh air and tremendous experience in human resource management and leadership to our Central Administrative team. The department would also like to recognize the many years of service to those staff who retired from the department: Kathryn Smith, Patricia Limburg, Lisa Oppelt continues to be the backbone of the Central Administration team. With over 30 years of experience in the department, she is a resource to many for her acumen in human resources, recruitment, promotion and tenure and nearly everything else that may come in question. Lisa oversees a stellar support team of Jessica Brown, Brittny Ellison, and Nancy Baldwin. Nancy continues in her role as Administrative Assistant for Central Administration and also supports Dr. Giovanni Schifitto. Jessica provides support of the Grand Rounds coordination and scheduling support of the Chair and Department Administrator. Brittny serves in a new role after the retirement of Mary Eichorn and assists Clara Vigelette with the residency program as well as providing support for the Chair’s office.

Department of Neurology alumni include faculty, residents, and fellows who have been members of the Department. Many have moved on from the small cadre of faculty who joined Dr. Joynt 50 years ago, the Department has attracted hundreds of talented physicians, and many of them have chosen to remain in or in contact with the Department. The value that Dr. Joynt placed on creating a comfortable, humanistic environment in which to learn and educate, care for patients, and pursue scholarship and discovery has remained to this day and has led to relationships that endure long after leaving the Department.

Alumni remain loyal to a school or department for many reasons. In speaking with alumni over the years it is apparent that they continue their attachment to the Department because of enduring friendships, professional collaborations, and long-term mentoring relationships. Alumni recognize that Rochester’s Department of Neurology represents a special “brand” that identifies a cohort with shared experiences, values, and professional accomplishments.

Dr. Joynt recognized the importance of alumni in the fabric of the Department when he took advantage of the American Academy of Neurology’s decision in the early 1980’s to reserve Tuesday evenings of the Annual Meeting for department reunions. From a small gathering of current and past faculty and residents, the reunion has grown to a much anticipated event that attracts dozens of individuals. Importantly, the reunion has fostered relationships that now connect alumni even though they were not in the Department during the same time span. These “inter-generational” relationships provide additional evidence as to the impact that the Department has had on alumni.

To recognize the contributions that faculty and alumni have made to the Department, an alumni award is presented to a current and former member of the Department at each annual reunion held at the Annual American Academy of Neurology meeting. Table I lists the Alumni award winners, who represent individuals with wide-ranging accomplishments. The awards ceremony is accompanied by a State of the Department presentation by the Chair and an update on education successes by Dr. Ralph Jozefowicz.

The Department is justifiably proud of its alumni, who have gone on to be well-respected neurologists in clinical practice, academics, government and industry. Many alumni have achieved senior leadership positions during their careers, and thus have been role models for countless others, thereby multiplying many-fold the impact that the Department has had on the lives of countless physicians. Alumni have been integral to development initiatives within the Department. Alumni have contributed to funds to honor Drs. Joynt, Marsh and Griggs.

Although we tend to only consider physician members of the Department when we think of alumni, we must also acknowledge as alumni the thousands of medical students that have benefitted from their interactions with the Department as well as the research scientists, nurses, technicians, and support staff that have been members of the Department at one time or another. All of these individuals have been touched by the Department and all represent the Department in some small way. Many of these alumni have maintained important ties the Department. Therefore, the Department’s influence has extended far beyond the conventional view of a network of [neurologist] alumni.

The alumni of the Department are its enduring legacy. Dr. Joynt would be so very proud of us.

LisaOppelt continues to be the backbone of the Central Administration team. With over 30 years of experience in the department, she is a resource to many for her acumen in human resources, recruitment, promotion and tenure and nearly everything else that may come in question. Lisa oversees a stellar support team of Jessica Brown, Brittny Ellison, and Nancy Baldwin. Nancy continues in her role as Administrative Assistant for Central Administration and also supports Dr. Giovanni Schifitto. Jessica provides support of the Grand Rounds coordination and scheduling support of the Chair and Department Administrator. Brittny serves in a new role after the retirement of Mary Eichorn and assists Clara Vigelette with the residency program as well as providing support for the Chair’s office.
Jamie Adams started medical school at the University of Rochester in 2007. She completed her fellowship in 2012. Currently she is a Senior Instructor at the University of Rochester. Her current work interests are Parkinson’s disease, Huntington’s disease, Dystonia, and Telemedicine. Her future plans are to continue as an attending movement disorder specialist here at the University of Rochester. She is married to Dan Lachant who works in Pulmonary and Critical Care as a fellow. They are expecting their first baby in October 2016. Her favorite “pearl” came from Dr. Richard Barbanco, “If’s”- fame, fortune, freedom, family. Fun. Another “pearl” she remembers is “repetition, repetition, repetition” from Dr. Ralph Jozefowicz. Her most memorable event was teaching neurology in Krakow, Poland during her third year of medical school. This was such a great experience and amazing trip! Her mentors include Richard Barbanco, Ray Dorsey, and Ralph Jozefowicz. Her most important event was getting married to her husband and starting a family!

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Jorge Almodovar-Suarez was at the University of Rochester for clinical neurophysiology fellowship from 2010-2011. He is currently an Assistant Professor at Dartmouth-Hitchcock Medical Center. His work interests are patient care, student/resident education and leadership. He is married to Lara, they have a daughter (Emilia) and a dog (Lugi). His most memorable experience was performing an EMG on a patient with hammer toes and high arches, which he noted an unexpected post-synaptic myasthenic defect on motor nerve conduction studies. A few years later he received a call from Dr. Herrmann wanting to include him as an author on a novel based on his studies.

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Michael Aptman was a resident from 1972. Currently he is an associate clinical professor at Florida International University Medical School and he also volunteers at University of Miami Medical School. He has been married to his wife Lynn for 47 years. He had 3 children, unfortunately one of his daughters was murdered in 1995 as a result he helped found melissainstitute.org for violence prevention.

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Michel Berg has been with the University of Rochester since 1987. He is currently a Professor and Director of the Epilepsy Program. His interests are assessing the generic equivalence of medications and developing an automated home medication dispenser. He is married to Dr. Sarah Nemetz and they have 2 children, Ben and Matt.

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Gretchen Birbeck joined the faculty at the University of Rochester in 2013. She is currently a Rykenboer Professor of Neurology at the University of Rochester. Her work interest are global neurology with a focus on epilepsy and infection – related seizures. She was married to the Chief of Neurorads at the University of Rochester.

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Peter Como served as faculty at the University of Rochester from 1984 to 2009. He is currently a Medical Reviewer at the Food and Drug Administration. His work interests are medical and clinical reviewer in the Division of Neurological and Physical Medicine Devises at the U.S. Food & Drug Administration. His future plans are to retire and start consulting. He is married to Lisa. His favorite “pearl” is when Dr. Horner was asked if money was the pharmaceutical industry was tainted, his reply was “yes, it taint enough”. The most important event from his time spent in Rochester was switching primary appointment from the Department of Psychiatry to the Department of Neurology and becoming a member of the Movement and Inherited Neurological Disorders (MIND) unit. His mentors were Robert Joynt, Ila Shoulson, Roger Kuran, and Eric Caine. One of his accomplishments after leaving Rochester was being fundamental involved in the FDA approval of recent drugs and medical devices for the diagnosis and treatment of neurological and psychiatric disorders.

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Tim Counihan served as faculty from 1997-2002. His most important event after leaving the University of Rochester was himself and son submitted an entry for the unfinished Sherlock Holmes pastiche series by the late great Bob Joynt, for which Neurology had invited submissions.

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Cory Ford was at the University of Rochester from 1982-1988. At the present time he is a Sr. Associate Dean at the University of New Mexico. He is interested in multiple sclerosis clinical care, multiple sclerosis clinical research, and research administration. His future plans are considering retiring by 2020 and plans to start a new career. He has a wife and two children. His most memorable event from living in Rochester was having interviewed and visited up the eastern seaboard, Philadelphia, New Haven and Boston but nothing felt right until the trip to Rochester.

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Elmar Frangenberg started his residency at the University of Rochester in 1969 and is now a Medical Director. His future plans is to maintain status quo. He has been married to his wife Catherine for 51 years. His favorite pearl was “when in doubt, go back to the patient” (Fred Horner). His mentors and colleagues, but nowhere near Berch level. His most important accomplishment after leaving Rochester was serving on the Tohoku University. He engaged in a private practice for seventeen years, then later retired. His future plans are to raise vegetables in a small garden on brighter days and read books on rainy days. He is married. His oldest daughter is a prefecture Delegate and his youngest is a physician nephrologist in Tokyo. He also has a son who is an Officer of a shipping business in Santiago, Chile. His favorite “pearl” was when Dr. Joynt asked him “Anything new?” he replied “Nothing specific.” Then Dr. Joynt said while smiling, “An ordinary thing is the best.” The most memorable event from his time spent in Rochester was his income increased double after leaving the University. His mentors were Dr. Joynt, Dr. Goldblatt, Dr. Marsh, Dr. Satran, Dr. Molinari, Dr. Summers, Dr. Mac Smith and Dr. Hornc.

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Daniel Gianc came to the University of Rochester in 1965 and completed the residency and fellowship program. He served as faculty until 1995. Currently he is a President at Lorna Linda University. His work interests are fusing an academic medical center and a Federally Qualified Health Center to create the largest Teaching Health Center in the country. He is married to Sarah Roddy with 3 children. The most memorable event was in morning report as a senior resident, he suggested a diagnosis. Berch went with a different one which was not the correct one. Berch responded with a laugh: “Giang 1, Griggs 1000.” That’s when he knew simultaneously he had made it to the big leagues, but nowhere near Berch level. His most important accomplishment after leaving Rochester was serving on the AAMC task force that is transforming the Medical Student Performance Evaluation (Dean’s Letter) into a reliable instrument that will promote holistic admissions for GME.
Linda Hershey competed her fellowship from 1978 to 1980 at the University of Rochester. She has been retired since July 2016. Even though she is retired her current work interest is writing about dementia and mild cognitive impairment with her colleagues from Oklahoma University Medical Center. Her future plans are to enter into training as a Stephen Minkin Lecturer. She is married to Charley and they have three children. Ed is a High School physics teacher in Chicago. Bill is an organic farmer in Eugene, OR and Erin is an orthopedic nurse in Portland, OR. A word of wisdom Dr. Ira Shoulson taught her was to pay close attention to the patients’ mood and cognitive status. The most memorable event from the time she spent in Rochester was during the second year of fellowship she served as a “junior attending” at the Monroe Community Hospital. Her mentors were: Ira Shoulson, Thomas Gift, Leonor Rivera-Calimlim, Robert Joynt and Louis Lasagna. After leaving Rochester in 2010 she appointed Professor of Neurology, Ethelyn McIwade Endowed Chair in Alzheimer’s Research, and Director of Dementia and Behavioral Disorders, University of Oklahoma Health Sciences Center.

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Todd Holmquist completed his residency, fellowship and serves as faculty at the University of Rochester since 2004. He is currently an Assistant Professor of Neurology at the University of Rochester. His work interests are attending physician for inpatient stroke and outpatient clinic, neuroimaging, medical educator and LEAN process improvements. His future plans are to continue to work for UR Medicine Department of Neurology. He has a wife, Amelia, and son Luke. Some of his hobbies consist of spending time with his family, gardening, wineing and dining. His favorite “pearl” was the way Dr. Robert “Bench” Griggs would describe a knowledge gap identified on bedside rounds as a “stumbling upon a morass of ignorance.” Though it seemed intimidating at the time now he looks back and laughs. His most memorable event was playing poker with his fellow residents and Dr. Robert Joynt at his home after a journal club. He has several mentors: Robert Joynt, Robert Griggs, Ralph Jozefowicz, Curtis Bensch, and William (Scott) Burgin.

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Natan Khishchenko completed his fellowship at the University of Rochester in 2008. Currently he is a Director of Neuromuscular Therapy at Monroe Community Hospital. His work interests are growing general neurology and neurophysiology at RRHS. He is married and he and his wife have 3 children. Some of his hobbies are going to jazz and rock concerts and practicing aikido. His favorite “Pearl” word is from Dr. Emma Ciafaloni, “Why can’t it (story) just be (the diagnosis)?” The most memorable event from his time in Rochester was having throat surgery in the middle of fellowship, not being able to talk for 2 weeks and having to communicate with techs and colleagues via a letter board. He would like to acknowledge everyone at SEC and Strong neuromuscular that put up with him and trained him. His three mentors are: Dr. Michel Berg, Dr. Lin Liu, and Dr. Eric Logigian. The most important accomplishment after leaving Rochester is having confidence and training to go to a mid-size hospital and function as army knife general neurologist and help grow the program.

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Seth Kolkin completed his residency program at the University of Rochester from 1986-1989. His current title is a Chief Neurology Psychiatry Rehabilitation Service at White River Junction VA. He has 2 sons, Zach 33, married, attorney in NYC and Zach 33 Artificial Intelligence computer science graduate student.

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Gary Myers came to the University of Rochester in 1971-78. Returning in 1990 and currently a Professor in Child Neurology. His current interest is child neurology practice with an emphasis on neonatal neurology and adverse environmental factors and nutrients from fish consumption. Married to Ruth, daughters (Cindy & Tracy (deceased)), 3 grandchildren by Tracy, and Sammie (a rescue greyhound). His most memorable event in Rochester was during the second year of fellowship, not being able to talk for 2 weeks and having to communicate with techs and colleagues via a letter board. He would like to acknowledge everyone at SEC and Strong neuromuscular that put up with him and trained him. His four mentors were: Frederick Horner, Robert Joynt, Richard Moxley and Robert Griggs. One of his major accomplishments was in 1989-1990, traveling to the Republic of Seychelles and lived there while enrolling the first cohort in the Seychelles Child Development Study (SCDS).

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Shree Pandya started at the University of Rochester in 1980 and is currently an Associate Professor in Neurology. Her interest is research related to Muscular Dystrophies. She is married to her husband (Kishan Pandya).

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Robert Herndon joined in 1977 until 1987 the faculty at University of Rochester. Currently he is a Professor of Neurology at the University of Rochester. He is interested in Demyelinating diseases, (MS, NMO) and Parkinson disease. His work on periodic paralysis led to the FDA-approval of his first treatment for these muscle diseases (in 2015). His latest accomplishment was receiving Fulbright Scholar Award for Lecturing in Neural Science and Neurology at Jagiellonian University in Krakow, Poland in 1992.

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David Lichter did his residency and fellowship from 1984-1989. He is currently a Clinical Professor of Neurology at The University of Buffalo. His work interests are clinical and medical research involving patients with movement disorders, particularly Parkinson’s disease (PD) and Tourette Syndrome (TS). In the future he would like to explore new fulfill measures as possible biomarkers of disease progression in PD. Further studies to better define predictors of outcome in adult TS. He has a wife that is a Pediatric Neurologist and 2 sons who are both interested in careers in Medicine. His most memorable event in Rochester was first week of residency and meeting Bob Joynt, in the Garvey Room, after Grand Rounds: “I hear you’re from the southern hemisphere, New Zealand, where people walk around on their heads. Your brain must be water-logged. It will probably take about two weeks to dry out. Until then, we won’t expect too much from you.”

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Linda Hershey competed her fellowship from 1978 to 1980 at the University of Rochester. She has been retired since July 2016. Even though she is retired her current work interest is writing about dementia and mild cognitive
Harald Reich completed his residency and fellowship from 1974 to 1978. He has been retired since 2012 and plans on doing more traveling. He is married with 2 children. One of his most memorable events was flying solo out of Rochester airport in 1977. His mentors were Robert Joynt, Frederic Horner and Shu-Ren Lin. After leaving Rochester one of his major accomplishments was opening a private practice in Adult and Pediatric Neurology in the 2000 year old city of Augsburg Germany in May of 1986.  

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Michael Rossen completed his residency, fellowship and served on the faculty at the University of Rochester from 1995-2004. Currently he is a Neurologist and has an interest in neurology cognitive neuroscience. He is married to Keli Troast and they have 2 daughters. His mentor was Charles Duffy.  

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Richard Rudick completed his residency and fellowship and served on the faculty at the University of Rochester from 1975-1986. Currently he is a Vice President at Biogen and has an interest in clinical and translational research focused on neurologic disease in the future. He is married to Marilyn and the most memorable event from the time in Rochester was the birth of their two children. While at the University of Rochester he had three mentors: Robert Joynt, Berch Griggs and Robert Herron. One of his most important accomplishments after leaving the University of Rochester was becoming the Chief Clinical and Translational Research Officer at the Cleveland Clinic Foundation serving from 2001 to 2008.  

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David Shprecher completed his fellowship from the University of Rochester in 2009. He is currently a Director of Movement Disorders. His work interest are program building and administration(clinical trials. In the future he plans to expand the movement disorder program at Banner Research and U of Arizona in Phoenix, move neuroprotection trials to the promotor stage of alpha-synucleopathies. He is married to his wife (Nobuko) and they have 1 daughter. The most memorable time spent in Rochester was joining the University of Rochester. His mentors are Rodger Kurian, Jon Minck, Karl Kieburtz, Ray Dorsey and Kevin Biglan. His important accomplishment after leaving Rochester in 2015, he became co-director of one of the first programs named as a Center of Excellence (and one of only 3 funded programs) by the Tourette Association of America.  

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Rabi Tawil has been with the Department of Neurology at the University of Rochester since 1988. He is currently a Professor. He is interested in clinical-research in neuromuscular diseases with emphasis on muscle channel disorders and FSH muscular dystrophy. His future plans are to find effective treatments for neuromuscular disorders. Rabi has a wife (Ghina Dumyati) and 2 children Yasmina and Kareem. His most memorable event was Launching the Fields Center for FSHD and Neuromuscular Research. Berch Griggs was his mentor.  

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Robert Thompson Stone is currently a Neurologist at the University of Rochester. His work interest are Child Neurology, Neuroimmunological and Medical Education. In the future he would like to lead more towards Academic Clinical Practice, Residency Director and Clerkship Director. He has a wife (Jennifer), and 2 children (Samuel and Rosemary). His most memorable event was discovering the unexpected enjoyment of treating children with neurologic problems and shifting his entire career focus to child neurology. This was made possible through the incredible teaching and support of the child neurology division. He had 4 mentors: Ralph Jozefowicz, Jonathan Minck, Robert Holloway and Andrew Goodman.  

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