

CURRICULUM VITAE: John Ravits, M.D., FAAN

**Neurology Section
Virginia Mason Medical Center
1100 Ninth Avenue
Seattle, WA 98101
Telephone (206) 223-6774
Email Clinic: John.Ravits@vmmc.org**

**Translational Research Program
Benaroya Research Institute
1201 Ninth Avenue
Seattle, WA 98101
Telephone: (206) 341-1944
Email Lab: jravits@benaroyaresearch.org**

PERSONAL DATA

Date of Birth: April 7, 1953
Place of Birth: St. Paul, Minnesota
Marital Status: Married, four children
Citizenship: United States

EDUCATION and TRAINING:

Yale University, New Haven, Connecticut
B.A. 1971-1975
Mayo Medical School, Rochester, Minnesota
M.D. 1975-1979
University of California, San Diego, California
Intern in Medicine 1979-1980
Resident in Neurology 1980-1983
Harvard Medical School, Brigham and Women's Hospital, Boston, Massachusetts
Clinical Research Fellow in Neurophysiology 1983-1984
National Institutes of Health (NIH), National Institute of Neurological Disorders and Stroke (NINDS), Bethesda, Maryland
Medical Staff Fellow in Clinical Neurophysiology 1984-1986

POSITIONS

Virginia Mason Medical Center, Seattle, Washington
Medical Staff (Neurology) 1986-present
Director, Clinical Neurophysiology Laboratory 1986-present
Benaroya Research Institute at Virginia Mason, Seattle, Washington
Affiliate Investigator 2004-2007
Research Associate Member 2007-present
University of Washington, Seattle, Washington
Clinical Instructor (Medicine) 1987-1989
Clinical Assistant Professor (Medicine) 1989-1996
Clinical Associate Professor (Neurology) 1996-2007
Clinical Professor (Neurology) 2007-present
Western ALS (WALS) Study Group
Director of Regional Site 1994-present
Northeast ALS (NEALS) Study Group
Director of Regional Site 2007-present
Evergreen ALSA Chapter
Medical Director and Board Member 1999-present

BOARD CERTIFICATIONS

Diplomate of National Board of Medical Examiners (Certificate #223505)	1980
Diplomate of American Board of Psychiatry and Neurology (Neurology) (Certificate # 27722)	1985
Diplomate of American Board of Electrodiagnostic Medicine (Certificate # 0718)	1989
Diplomate of American Board of Psychiatry and Neurology: Added Qualifications in Clinical Neurophysiology (Certificate # 156)	1992
Recertification	2004
Diplomate of American Board of Psychiatry and Neurology: Added Qualifications in Neuromuscular Medicine (Certificate # 157)	2008

PROFESSIONAL SOCIETY MEMBERSHIPS:

American Academy of Neurology Member	1982
Fellow	2003
American Association of Neuromuscular and Electrodiagnostic Medicine Member	1984
Fellow	1986
American Clinical Neurophysiology Society Member	1984
World Federation of Neurology (Member)	1998
Society for Neurosciences	2006
Washington State Medical Association (Member)	1986
King County Medical Society (Member)	1986

PAST COMMITTEES, OFFICES AND MAJOR PROFESSIONAL ACTIVITIES

Virginia Mason Medical Center Hyperbaric Committee	1988-93
Insurance Committee	1990-1996
Personnel	1990-94
Referral Management	1994-1995
Head, Section of Neurology	1996-2002
Clinical Research Chair	April 2005-April 2006
Clinical Research Chair	Jan 2007-present
Puget Sound Neurologic Association President	1995-1996
Neurology Advisory Board for ALS C.A.R.E.	1995-1999
American Association of Electrodiagnostic Medicine (AAEM) Journal Committee	1988
Course Committee	1989-90
Constitution Committee	1991-92
Equipment & Computer Program	1994-95
Program Committee	1995-98
Professional Practices Committee	1999-2002
AAEM Washington State Liaison	1998-2002
American Academy of Neurology Strategic Direction #5 Task Force on New Tools for Neurologists	1997-1999

MISCELLANEOUS ACADEMIC ACTIVITIES

American Board of Psychiatry and Neurology: Board Examiner

	1989, 1993, 1996, 2001, 2003, 2004
American Board of Electrodiagnostic Medicine: Board Examiner	1997,2000, 2001
Editorial Board	
<i>ALS and Other MND</i>	2008-present
<i>Journal Neurodegeneration and Regeneration</i>	2008-present
Ad Hoc Reviewer	
<i>Muscle & Nerve</i>	Ongoing
<i>Journal of Clinical Neurophysiology</i>	Ongoing
Ad Hoc Member, Medical Advisory Committee, Muscular Dystrophy Association	2009

LICENSURE:

Washington (active)
California, Massachusetts, and Virginia (inactive)

CLINICAL SUBSPECIALTY INTERESTS:

Neuromuscular diseases including motor neuron diseases and immune-mediated diseases
Clinical neurophysiology, including electrodiagnosis, autonomic testing and intraoperative monitoring
Movement disorders and botulinum toxin therapy

RESEARCH INTERESTS

ALS and functional genomics, laser capture microdissection and cell-specific gene expression (microgenomics), bioinformatics, exon splicing, ALS neuropathology, and tissue banking
ALS biomarkers
ALS clinical trials

RESEARCH ACTIVITIES and FUNDING

Principal investigator, Seattle site: Double-blind Trial of Human Recombinant Ciliary Neurotrophic Factor in ALS (1993-5). Grant included three sub-studies: 1) Natural History, 2) Clinical Testing, & 3) Post Testing. Funded by Synergen Corporation, ~\$250,000.

Principal investigator, Seattle site of Western ALS (WALS) Study Group: Double-blind trial of Gabapentin in ALS (1995-6); funded by WALS (with limited corporate support), ~\$75,000.

Principal investigator, Early access program of Riluzole (1995-6). Funded by Rhone-Poulenc Rorer, Inc., ~\$15,000.

Principal investigator, Early access program for Myotrophin in ALS (1996-9). Funded by Cephalon, Inc., ~\$10,000.

Principal investigator, Seattle site of Western ALS Study Group: Follow-up Study of Double-blind trial of Gabapentin in ALS (1996-9). Investigator initiated study funded by WALS Study Group (with limited corporate support), ~\$75,000.

Principle investigator, ALS Tissue Bank and Neuro-genomics Lab, Benaroya Research Institute, (2001-present).
Grant from Virginia Mason Research Center, \$39,000. (2001)
Grant from Juniper Foundation, Seattle, WA, 2003-5, \$30,000 (2002-2004)
Grant from Moyer Foundation, Seattle, WA, 2003, \$85,000 (Oct, 2003)
Grant from Moyer Foundation, Seattle, WA, 2004, \$85,000 (Dec, 2004)
Philanthropic donations, various private donors and foundations, ~\$100,000-\$200,000 per year (2005-present)

Principle investigator, Seattle site of Western ALS Study Group: Double-blind trial of minocycline in ALS (2002-present). Funded by NIH RO1 NS045294-01, ~\$95,000.

Principle investigator, Microgenomic Studies of ALS, NIH R21 NS051738-01A1, \$275,000 Jan 1, 2006-Dec 31, 2007

Principle investigator, Pilot 3, Neuronal and Matrix Interactions and Motor neuron injury and repair, BRI Center for Inflammation and Tissue Repair, USAMRMC Proposal #06054001, Jan 2006-present.

Principle investigator, Microsoft Research Research Program Development, Microsoft Corp, Redmond, WA, ALS Genomics, Apr 1, 2008-Mar 31, 2010, \$1,000,000 (renewable Apr 1, 2010-2011, \$500,000).

HONORS:

Aurelian Honor Society
Yale University 1974-5

Commencement Speaker
Mayo Medical School 1979

Student Teaching Award
University of California, San Diego 1981

Named one of King County's "Best Doctors"
Seattle Magazine 2000, 2005

Named one of Puget Sound Areas "Top Doctors"
Center for the Study of Services, Consumers' CHECKBOOK 2002, 2003, 2006

Spirit of Lou Gehrig Award (Presented at Safeco Field on Lou Gehrig's 100th Birthday and threw out the 1st pitch)
June 19, 2003

Golden Stethoscope Award for top doctors
Seattle Metropolitan Magazine 2008

University of Washington Alpha Omega Alpha Honor Medical Society's Volunteer Clinical Faculty of the Year Award 2009

Named one of America's "Top Doctors"
Center for the Study of Services, Consumers' CHECKBOOK 2009

NATIONAL/INTERNATIONAL PRESENTATIONS:

1. No morphometric abnormality of the recurrent laryngeal nerve in spastic dysphonia. 8th International Congress of Neuropathy, Washington, DC, September 1978.
2. Primary writing tremor and primary writing myoclonus: Unusual task-specific movement disorders. Boston Society of Psychiatry and Neurology, Boston, MA, February 1984.
3. Primary writing tremor and myoclonic writer's cramp. 31st Annual Meeting of the American Association of Electromyography and Electrodiagnosis, Kansas City, MO, September 1984.
4. Spontaneous reticular myoclonus. 32nd Annual Meeting of the American Association of Electromyography and Electrodiagnosis, Las Vegas, NV, October 1985.
5. Adult-onset body tic. 38th Annual Meeting of the American Academy of Neurology, New Orleans, LA, May 1986.

6. A comparative study of electrophysiologic tests of autonomic function in patients with primary autonomic failure. 33rd Annual Meeting of the American Association of Electromyography and Electrodiagnosis, Boston, MA, September 1986.
7. Autonomic function testing workshops. 34th Annual Meeting of the American Association of Electromyography and Electrodiagnosis, San Antonio, TX, December 1987; 35th annual meeting, San Diego, CA, September 1988; 36th annual meeting, Washington, DC, September 1989; 37th annual meeting, Chicago, IL, 1990; 38th annual meeting, Vancouver, BC, Canada, 1991; 39th annual meeting, Charleston, SC, 1992; 42nd annual meeting, Montreal, Canada, 1995, 43rd annual meeting, Minneapolis, MN, 1996 and 45th annual meeting, Orlando, FL, 1998; 46th annual meeting, Vancouver, Canada, 1999; 49th annual meeting, Albuquerque, NM, 2001; 50th annual meeting, Toronto, Canada, 2002.
8. Clinical and electrophysiologic findings in Fabry's disease. 37th Annual Meeting of the American Association of Electrodiagnostic Medicine, Chicago, IL, September 1990.
9. Testing cardiac and vascular autonomic reflexes. 41st annual meeting of American Association of Electrodiagnostic Medicine, Course on Autonomic Function, San Francisco, CA, 1994.
10. Update on Autonomic Function. Annual meeting of the American College of Occupational and Environmental Medicine, course on Advances and Controversies in Clinical Medicine. October 1995.
11. Autonomic Neuropathy, Breakfast Seminar. 43rd Annual Meeting of the Annual Meeting of the American Association of Electromyography and Electrodiagnosis, AAEM, Mpls, MN, 1996 and 45th Annual Meeting, Orlando, FL, 1998.
12. Demyelinating Neuropathies. Morning Seminar given at 60th Annual Meeting of the American Academy of Physical Medicine and Rehabilitation, November 6, 1998.
13. Assessment of Autonomic Function. 24th Annual Electrodiagnosis and Clinical Neurophysiology: A High Intensity Review, Rehabilitation Institute of Chicago, Chicago, IL, March 15, 2001.
14. Quantitative EMG. 24th Annual Electrodiagnosis and Clinical Neurophysiology: A High Intensity Review, Rehabilitation Institute of Chicago, Chicago, IL, March 15, 2001.
15. Dystonia: Workshop for the Use of Botulinum Toxins, Co-sponsored by the Movement Disorder Society, the National Institutes of Health and the Foundation for the Advanced Education of the Sciences (NIH/FAES), Seattle, WA, October 12, 2001.
16. Advanced Treatment of Dystonia and Spasticity: Workshop Demonstrating the Use of Botulinum Toxin. Program of the American Academy of Neurology, The Movement Disorder Society and WE MOVE, Seattle/Bellevue; October 16, 2004.
17. Motor Neuron Isolation by Tissue Microdissection for Biochemistry in ALS Nervous Systems, poster presentation at the 15th International Symposium on ALS/MND, Philadelphia, December 2, 2004.
18. RNA Assessment in ALS Nervous Systems and Motor Neurons Isolated by Microdissection in ALS Nervous Systems, poster presentation at the 15th International Symposium on ALS/MND, Philadelphia, December 2, 2004.
19. Focality of ALS: 3-D Topography of Lower Motor Neuron Degeneration in Post-Mortem Nervous Systems and the Neuropathologic Gradient of Degeneration. Poster presentation at the 58th Meeting of the American Academy of Neurology, San Diego, CA, April 5, 2006.
20. ALS at the Onset: Topography of UMN and LMN Loss; platform presentation at the 17th International Symposium on ALS/MND, Yokohama, Japan, December 2, 2006.

21. Differential Genes Set Expression in SALS Motor Neuron and Anterior Horn Enriched RNA Pools Using Whole Genome Oligonucleotide Microarray. 18th International Symposium on ALS/MND. Toronto, Canada, Dec 1, 2007.
22. Correlation Between Genome-wide SNP and Whole Genome Expression: Discovery-based Pursuit of SALS Pathobiology. 18th International Symposium on ALS/MND. Toronto, Canada, Dec 1, 2007.
23. Deciphering ALS. Canadian ALS Research Annual Meeting, Toronto, Canada, May, 2008.
24. Differential Genes Set Expression in G93A Transgenic Mice Using Whole Genome Oligonucleotide Microarray. 19th International Symposium on ALS/MND. Birmingham, UK, Nov 3, 2008.
25. Distribution of TDP-43 Intracytoplasmic Inclusions in the ALS Gradient of Neurodegeneration. 19th International Symposium on ALS/MND. Birmingham, UK, Nov 3, 2008.
26. ALS Focality: Motor Neuron Degeneration in the House of Mirrors. 15th Annual Halseth ALS Lecture, University of Colorado Health Sciences University, Aurora/Denver, CO, February 11, 2009.
27. Linkage between disease onset and progression, 3rd International Research Workshop on Frontotemporal Dementia in ALS, London, Ontario CA, June 22, 2009

PUBLICATIONS:

1. **Ravits JM**, Aronson AE, DeSanto LW, Dyck PJ: No morphometric abnormality of the recurrent laryngeal nerve in spastic dysphonia. *Neurology* 1979; 29:1376-1382.
2. Green LF, Farrow GM, **Ravits JM**, Tomera F: Prostatic adenocarcinoma of ductal origin. *J Urol* 1979; 121:303-305.
3. **Ravits JM**, Seybold ME: Amaurosis fugax from angle-closure glaucoma. *Arch Neuro* 1984; 41:991-993.
4. **Ravits J**, Baker M, Hallett M: Spontaneous reticular myoclonus (abstract). *Muscle Nerve* 1985; 8:621.
5. **Ravits J**, Hallett M, Baker M, Wilkins D: Primary writing tremor and myoclonic writer's cramp. *Neurology* 1985; 35:1387-1391.
6. **Ravits J**, Hallett M: Pathophysiology of hemifacial spasm (letter). *Neurology* 1986; 36:591-3.
7. Dalakas M, Elder G, Hallett M, **Ravits J**, et al: A long-term follow-up study of patients with post-poliomyelitis neuromuscular symptoms. *N Engl J Med* 1986; 314:959-963.
8. **Ravits J**, Hallett M, Baker M, Wilkins D: Adult-onset body tic (abstract). *Neurology* 1986; 36 (suppl. 1):118.
9. Baker M, Hallett M, Wilkins D, **Ravits J**, et al: Physiology of epilepsy partialis continua (abstract). *Neurology* 1986; 36 (suppl. 1):128.
10. **Ravits J**: Autonomic Function Testing (An AAEE workshop). American Association of EMG and Electrodiagnosis. Rochester, MN, October 1987, pp. 1-4. (Revised 1990)
11. **Ravits J**: Myasthenia gravis, a well-understood neuromuscular disorder. *Postgrad Med* 1988; 83:219-222.
12. Nilsson J, **Ravits J**, Hallett M: Stimulus artifact compensation using biphasic stimulation. *Muscle Nerve* 1988; 11:597-602.
13. Geller B, Hallett M, **Ravits J**: Botulinum therapy in hemifacial spasm: clinical and electrophysiologic studies. *Muscle Nerve* 1989; 12:716-722.
14. **Ravits J**, Hallett M, Baker M, Nilsson J, Dalakas M: Clinical and electromyographic studies of postpoliomyelitis muscular atrophy. *Muscle Nerve* 1990; 13:667-674.

15. Hallett M, **Ravits J**, Dubinsky R, et al: A double-blind trial of isoniazid for essential tremor and other action tremors. *Movement Disorders*, 1991; 6(3):253-256.
16. Demirer T, **Ravits J**, Aboulaflia D: Myasthenic (Eaton-Lambert) syndrome associated with pulmonary large-cell neuroendocrine carcinoma. *S Med J*, 1994; 87(11):1186-9.
17. **Ravits J**, Hallett M, Nilsson J, et al: Electrophysiological studies in idiopathic autonomic failure syndromes. *Muscle Nerve*, 1996; 19:758-763.
18. Miller RG et al and the ALS CNTF Treatment Study (ACTS) Group (including **Ravits J**): A, placebo-controlled trial of subcutaneous recombinant human ciliary neurotrophic factor (rhCNTF) in amyotrophic lateral sclerosis. *Ann Neurol*, 1996;39(2) 256-60.
19. McGuire D et al and the SSNJV/CNTF ALS Study Group (including **Ravits J**): Relationship of the Tufts Quantitative Neuromuscular Exam (TQNE) and the Sickness Impact Profile (SIP) in measuring progression of ALS. *Neurology*, 1996; 46(5):1442-4.
20. Miller RG, et al (including **Ravits J**): Placebo-controlled trial of gabapentin in patients with amyotrophic lateral sclerosis. *Neurology*, 1996; 47:1383-1388.
21. **Ravits J**: AAEM Minimonograph #48: Autonomic Nervous System Testing. *Muscle Nerve*, 1997;20:919-937.
22. McGuire D et al and the Syntex-Synergen ALS/CNTF Study Group (including **Ravits J**): A brief quality-of-life measure for ALS clinical trials based on subset of items from the sickness impact profile. *J Neurol Sci*. 1997;152 Suppl 1:S18-22.
23. Hoagland RJ et al and The Syntex/Synergen Neuroscience Joint Venture rhCNTF ALS Study Group (including **Ravits J**): Reliability of maximal voluntary isometric contraction testing in a multicenter study of patients with amyotrophic lateral sclerosis. *Muscle Nerve* 1997;20 (6):691-5.
24. Ross MA, Miller RG Berchert L et al and the rhCNTF ALS Study Group (including **Ravits J**): Toward earlier diagnosis of amyotrophic lateral sclerosis: Revised criteria. *Neurology*, 1998;50:768-772.
25. **Ravits J**: Neurology epitome: update on treatment of peripheral neuropathy. *West J Med* 168:268-9, 1998.
26. Fernandez M, McClain ME, Martinez RA, Snow K, Lipe H, **Ravits J**, Bird TD, & LaSpada AR: Late-onset SCA2: 33 CAG repeats are sufficient to cause disease. *Neurology* 2000;55(4):569-572.
27. Miller RG, Moore D, Gelinias DF et al (including **Ravits J**): Phase III randomized trial of gabapentin in patients with amyotrophic lateral sclerosis. *Neurology* 2001;56:843-848.
28. Bryan WW, Hoagland RJ, and The Syntex/Synergen Neuroscience Joint Venture rhCNTF ALS Study Group (including **Ravits J**): Can we eliminate placebo in ALS clinical trials? *ALS and other Motor Neuron Diseases* 2003;4:11-15.
29. Andersen PM, Sims KB, Xin WW, Kiely R, O'Neill G, **Ravits J**, Piro E, Harati Y, Brower RD, Levine JS, Heinicke HU, Seltzer W, Boss M, Brown RH. Sixteen novel mutations in the gene encoding CuZn-superoxide dismutase in ALS. *Amyotrophic Lateral Sclerosis and other motor neuron disorders*, 2003; 2: 62-73.
30. **Ravits J**: Sporadic amyotrophic lateral sclerosis—a hypothesis of persisting enteroviral infection. *Amyotrophic Lateral Sclerosis and other motor neuron disorders* 2005;6:77-87.
31. Weiss MD, **Ravits JM**, Schuman N, Carter GT: A4V superoxide dismutase mutation in apparently sporadic ALS. *Amyotrophic Lateral Sclerosis and other motor neuron disorders* 2006 Mar;7(1):61-3.
32. Mackenzie IRA, Bigio EH, Ince PG, Geser F, Neumann M, Cairns NJ, Kwong LW, Forman MS, **Ravits J**, Shaw PJ, Stewart H, McClusky L, Kretschmar HA, Monoranu C, Highley R, Kirby J, Siddique T, Lee V M-Y, Trojanowski JQ: Pathological TDP-43 distinguishes sporadic ALS from ALS with *SOD-1* mutations. *Ann Neurol* 2007;61:427-434.

33. **Ravits J**, Paul P, Jorg C: Focality of upper and lower motor neuron degeneration at the clinical onset of ALS. *Neurology* 2007;68:1571-1575.
34. **Ravits J**, Laurie P, Fan Y, and Moore DH: Implications of ALS focality: rostral-caudal distribution of lower motor neuron loss postmortem. *Neurology* 2007;68:1576-1582.
35. Gordon PH, Moore DH, Miller RG et al (incl **Ravits J**): Efficacy of minocycline in patients with amyotrophic lateral sclerosis: a phase III randomized trial. *Lancet Neurology* 2007;6:1045-53.
36. Xiao S, Tjostheim S, Horne P, Fan Y, **Ravits J**, Strong M, Fan Y, Robertson J: An aggregate-inducing peripherin isoform generated through intron retention is upregulated in amyotrophic lateral sclerosis and associated with disease pathology. *J Neurosci*. 2008;28(8):1833-40.
37. Kim YJ, Fan Y, Laurie P, 'Hugo' Kim JM, **Ravits J**: No evidence of HIV pol gene in spinal cord tissues in sporadic ALS by real-time RT-PCR. *Amyotroph Lateral Scler*. 2009;Mar 25:1-9.
38. **Ravits J**, LaSpada A: Motor phenotype heterogeneity, focality, and spread in ALS: deconstructing motor neuron degeneration. *Neurology* 2009; 73: 805– 811.
39. Rabin S, Kim H, Baughn M, Libby R, Kim Y, Fan Y, La Spada A, Libby RT, Stone B, **Ravits J**: Sporadic ALS has compartment-specific aberrant exon splicing and perturbation of cell-matrix adhesion biology. *Human Molecular Genetics* 2010;19:313–328.
40. Bodansky A, Kim H, Tempest L, Velagupudi A, Libby RT, **Ravits J**: TDP-43 and ubiquitinated cytoplasmic aggregates in ALS are low frequency and widely distributed in the lower motor neuron columns independent of disease spread. *Amyotroph Lateral Scler* (Jan 2010, in press).

BOOK CHAPTERS:

1. Hallett M, **Ravits J**: Involuntary movement disorders. In: Asbury AK, McKhann GM, McDonald WI (eds): *Diseases of the Nervous System*. Ardmore Medical Books and William Heinemann Medical Books, 1986.
2. Patterson L, **Ravits J**: Myasthenia gravis. In: Taylor RD (ed): *Difficult Medical Management*. WB Saunders Co., 1991.
3. **Ravits J**: Muscle weakness. In: Fihn SD and McGee SR (eds): *Outpatient Medicine*. WB Saunders Co., 1992 and 1998 (2nd edition).
4. **Ravits J**: Electromyography and nerve conduction studies. In: Fihn SD and McGee SR (eds): *Outpatient Medicine*. WB Saunders, Co., 1992 and 1998 (2nd edition).
5. **Ravits J**, Laurie P, and Stone B: Amyotrophic lateral sclerosis microgenomics. *Phys Med Rehabil Clin N Am*. 2005;16 (4):909-24.
6. **Ravits J**, Traynor BJ: Current and future direction in genomics of amyotrophic lateral sclerosis. *Phys Med Rehabil Clin N Am* 2008;19(3):461-477.