

Zoher Ghogawala, MD, FACS
Curriculum Vitae

A. Personal Information

Citizenship – U.S.A.

Medical Licensure – New York – 217734-1 (active)

Connecticut – 038387 (active)

Massachusetts – 150191 (active)

B. Address and Telephone Numbers

Office – 25 Valley Drive, Greenwich, CT 06830

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C. Education

A.B., magna cum laude, 1987, Harvard College

M.D., magna cum laude, 1991, Harvard Medical School

D. Professional Positions

1991-1992 Intern, Medical Service, Massachusetts General Hospital

1992-1993 Intern, Surgical Service, Massachusetts General Hospital

1993-1995 Junior Resident, Neurosurgical Service, Mass General Hospital

1996-1997 Post-doctoral Fellow, Laboratory (Dr. Richard Mulligan), Whitehead Institute, Massachusetts Institute of Technology and Childrens Hospital, Harvard Medical School

1996-1997 Attending Physician, Emer. Services, Mass General Hospital

1997-1998 Senior Resident, Neurosurgical Service, Mass General Hospital

1999 Chief Resident, Neurosurgical Service, Mass General Hospital

6-12 /1999 Attending Physician, Neurosurgical Service, Mass General Hosp

2001-2002 Clinical Assistant Professor of Neurosurgery, Cornell University

2000-pres Attending Physician, Neurosurgery, Greenwich Hospital

2001-pres Clinical Assistant Professor of Neurosurgery, Yale University

2006-pres Director, Wallace Clinical Trials Center, Greenwich Hospital

2008-pres Attending Physician, Neurosurgery, Yale New-Haven Hospital

E. Professional Certification/ Memberships

2001-pres Congress of Neurological Surgeons, Member

2004-pres AANS-CNS Spine Section, Active Member

2004-pres Diplomate, American Board of Neurological Surgery

2004-pres American Assoc of Neurological Surgeons, Member

2005-pres AANS-CNS Spine Section Outcomes Committee Member

2006-pres AANS-CNS Spine Section Outcomes/ Trials Committee Chairman

2006-pres AANS-CNS Spine Section Executive Committee Member

2006-pres Fellow, American College of Surgeons

2007-pres Active Member, Cervical Spine Research Society

2007-pres	Member, CNS Research Committee
2008-pres	Lumbar Spine Outcomes Task Force (AANS-CNS Spine Section)
2008-pres	Professional Society Coalition (NASS, AAOS, SRS, AANS-CNS) on Lumbar Spinal Fusion Outcomes (Advisory Panel for CMS)
2008-pres	Member, CNS Academic Community Alliance Committee
2008-pres	National Quality Forum Steering Committee – Technical Advisor
2008-pres	National Institutes of Health – (NINDS) ImPACT Model Consultant
2008-pres	Low Back Pain Workgroup - Member (Robert Wood Johnson Foundation) – Characterizing Episodes and Costs of Care
2009-pres	Congress of Neurological Surgeons, Executive Committee Member
2009-pres	Congress of Neurological Surgeons, Membership Committee Chair
2009-pres	AANS-CNS Quality Improvement Committee
2010-pres	North American Spine Society, Research Council Chair
2010-pres	Congress of Neurological Surgeons, Education Committee Vice-Chair

F. Honors and Awards

1996	Nessel Gene Therapy Award
1996	Brain Tumor Society Research Award (Co-Investigator)
1996 & 1997	CapCURE Research Award (Co-Investigator)
1997	NIH National Research Science Award
2005-2006	Best Doctors in America (4% of American Physicians)
2006	Who's Who in America (60 th Edition)
2006	Whitcomb Lecturer, New England Neurosurgical Society
2007	Yale University Junior Faculty Award (NIH – CTSA)
2007	Who's Who in America (61 st Edition)
2007	Best Doctors - New York Metro Area (Castle Connolly 11 th Edition)
2008	Best Doctors – New York Metro Area (Castle Connolly 12 th Edition)

G. Institutional Responsibilities

Teaching (5%) – Supervision of residents in conferences, clinic, and at surgery
Clinical Care (75%)
Research (20%) – Director, Wallace Clinical Trials Center

H. Research Support

Nessel Gene Therapy Research Award, \$20,000 - 1996 (one-year)
Brain Tumor Society Award, \$50,000 - 1996 (one-year)
NIH National Research Science Award, \$33,500 - 1997 (one-year)
Camilla H. Kelley Stroke Research Grant, \$ 45,000 - 2005 (one-year)
Greenwich Lumbar Stenosis SLIP Study Fund, \$ 263,407 - 2003-2008
Wallace Clinical Trials Center Grant, \$ 1,100,000 – 2006-2012
NIH Clinical and Translational Science Yale Faculty Grant \$ 25,000 – 2007-2008
Am Assoc of Neuro Surgeons Neuropoint – SD Grant \$ 200,000 - 2010-2012
Wallace Carotid Outcomes Study Grant, \$ 200,000 - 2010-2012

I. Patents/ Inventions

2003 Modified T Lymphocytes and Uses Thereof
(Application No. PCT/USO3/14343)

J. Scientific Review

Scientific Abstract Reviewer, World Spine III (Rio de Janeiro, Brazil, 2005)
Reviewer, Practical Reviews in Neurosurgery, 2006 – pres
Ad hoc Reviewer, The Journal of Orthopaedic Surgery and Research, 2008
Ad hoc Reviewer, The European Journal of Neurology, 2008
Associate Editor, Neurosurgery, 2009

K. Teaching Experience

1996-1997 Instructor, HMS ‘Human Nervous System and Behavior’
2001-pres Clinical Research Mentor, Residents and Medical Students
2005-pres Instructor, Yale Neurosurgery Residency Spine Conference

J. Harvard Alumni Service

1996 Chairman, Fifth Class Reunion
2001 Chairman, Tenth Class Reunion
2006 Chairman, Fifteenth Class Reunion

Bibliography

A. Articles in Professional Journals

1. Griffith IJ, Nabavi N, **Ghogawala Z**, Chase CG, Rodriquez M, McKean DJ, Glimcher LH: Structural mutation affecting intracellular transport and cell surface expression of murine class II molecules. *J Exp Med* 167:541-555, 1988.
2. Griffith IJ, **Ghogawala Z**, Nabavi N, Golan DE, Myer A, McKean DJ, Glimcher LH: Cytoplasmic domain affects membrane expression and function of an Ia molecule. *Proc Natl Acad Sci USA* 85:4847-4851, 1988.
3. Nabavi N, **Ghogawala Z**, Myer A, Griffith IJ, Wade WF, McKean DJ, Glimcher LH: Antigen presentation abrogated by truncated Ia molecules. *J Immunol* 142:1444-1447, 1989.
4. St-Pierre Y, Nabavi N, **Ghogawala Z**, Glimcher LH, Watts TH: A functional role for the cytoplasmic domain of a murine MHC class II protein. *J Immunol* 143:808-812, 1989.

5. **Ghogawala Z**, Choi E, Daly KR, Blanco LR, Griffith IJ, Glimcher LH: An intronic 10 basepair deletion in a class II Ab gene affects RNA processing. *Mol Cell Biol* 9:4402-4408, 1989.
6. **Ghogawala Z**, Furtado: In vitro and in vivo bactericidal properties of 1%, 2.5%, and 10% povidone-iodine. *Am J Hosp Pharm* 47:1562-1566, 1990.
7. **Ghogawala Z**, Moore M, Strand R, Kupsky WJ, Scott RM: Clival chondroma in a child with Ollier's disease: Case report. *Pediatr Neurosurg* 17:53-56, 1991-1992.
8. Lampson LA, Chen A, Vortmeyer AO, Sloan AE, **Ghogawala Z**, Kim L: Enhanced T cell migration to sites of microscopic CNS disease: complementary treatments evaluated by 2- and 3-D image analysis. *Brain Pathol* 4:125-134, 1994.
9. **Ghogawala Z**, Schumacher JM, Ogilvy CS: Distal basilar perforator artery aneurysm: Case report. *Neurosurgery* 39:393-396, 1996.
10. **Ghogawala Z**, Mansfield FL, Borges LF: Spinal radiation before surgical decompression adversely affects outcomes of surgery for symptomatic metastatic spinal cord compression. *Spine* 26:818-824, 2001.
11. Niederman T, **Ghogawala Z**, Carter BS, Mulligan RC: Antitumor activity of cytotoxic T lymphocytes engineered to target vascular endothelial growth factor receptors. *Proc Natl Acad Sci (USA)* 99 (10):7009-14, 2002.
12. **Ghogawala Z**, Benzel EC, Amin-Hanjani S, Barker FG, Harrington JF, Magge SN, Strugar J, Coumans JV, Borges LF: Prospective outcomes evaluation of decompression with or without instrumented fusion for lumbar stenosis with degenerative grade I spondylolisthesis. *J Neurosurg (Spine 1)* 3:267-272, 2004.
13. **Ghogawala Z**, Coumans JV, Benzel EC, Stabile LM, Barker FG: Clinical eligibility for a randomized controlled trial of ventral versus dorsal decompression for cervical spondylotic myelopathy: Results of a survey of the Cervical Spine Research Society. *SPINE* 32 (4):429-436, 2007.
14. **Ghogawala Z**, Westerveld M, Amin-Hanjani S: Cognitive outcomes after carotid revascularization: The role of cerebral emboli and hypoperfusion. *Neurosurgery* 62:385-395, 2008.
15. **Ghogawala Z**, Barker FG, Carter BS: Clinical Equipoise and the Surgical Randomized Controlled Trial. *Neurosurgery (Science Times)* 62 (6):N9-N10, 2008.
16. King JT, Abbed KM, Gould GC, Benzel EC, **Ghogawala Z**: Cervical spine re-operation rates and hospital resource utilization following initial surgery for degenerative cervical spine disease in 12,644 patients in the United States *Neurosurgery* 65:1011-1023, 2009.
17. **Ghogawala Z**, Martin B, Benzel EC, Dziura JD, Magge SN, Abbed KM, Bisson EF, Shahid J, Coumans JVC, Choudhri TF, Steinmetz MP, Krishnaney AA, King JT, Butler WE, Barker FB, Heary RF: Comparative effectiveness of ventral versus dorsal surgery for cervical spondylotic myelopathy: a pilot study. *Neurosurgery* 2011 (in press).

B. Textbooks

1. **Ghogawala Z**, Krishnaney A, Steinmetz M, Batjer H, Benzel E (eds). *The Evidence for Neurosurgery*, TFM Publishing Ltd., Castle Hill Barns, Harley, Shrewsbury, United Kingdom. 2010, 350 pages (in press).

C. Reviews and Book Chapters

1. **Ghogawala Z**, Butler WE: Hypertensive intracerebral hemorrhage – a new role for stereotactic neurosurgery. *Neurovascular News* Fall: 3-5, 1994.
2. **Ghogawala Z**, Ogilvy CS: Intramedullary cavernous malformations of the spinal cord. *Neurovascular News* Fall: 3-6, 1998.
3. **Ghogawala Z**, Ogilvy CS: Intramedullary cavernous malformations of the spinal cord. *Neurosurg Clin North Amer* 10:101-111, 1999.
4. Curry WT, **Ghogawala Z**, Gollogly S, Brodke D: Postoperative Imaging. In *Spine Surgery: Techniques, Complication Avoidance, and Management 2nd Edition* (ed. Edward C. Benzel, MD), Harcourt Health Sciences, Philadelphia, PA, 2004, pp1768-1777.
5. Whitmore RG, **Ghogawala Z**, Curry WT, Gollogly S, Brodke DS: Postoperative Imaging. In *Spine Surgery: Techniques, Complication avoidance, and Management 3rd Edition* (ed. Edward C. Benzel, MD), Harcourt Health Science, Philadelphia, PA (in press)
6. Hoh D, Abbed K, **Ghogawala Z**: The Meaningful Retrospective Analysis. In *Spine Surgery: Techniques, Complication avoidance, and Management 3rd Edition* (ed. Edward C. Benzel, MD), Harcourt Health Science, Philadelphia, PA (in press)
7. **Ghogawala Z**, Whitmore RG: The Art of the Clinical Trial. In *Spine Surgery: Techniques, Complication avoidance, and Management 3rd Edition* (ed. Edward C. Benzel, MD), Harcourt Health Science, Philadelphia, PA (in press)
8. **Ghogawala Z**, Carter BS, Barker FG: Clinical Evidence. In *The Evidence for Neurosurgery* (ed. Edward C. Benzel, MD, Hunt Batjer, MD, and Zoher Ghogawala, MD), TFM Publishing, Ltd. Castle Hill Barns, Shrewsbury, UK (in press).
9. **Ghogawala Z**, Amankular N, Heary RF: Cervical Spondylotic Myelopathy. In *Spinal Cord Medicine 2nd Edition* (ed. Denise I Campagnolo, MD), LWW Publishing, Philadelphia, PA) (in press).

D. Selected Oral Presentations

1. **Ghogawala Z**, Mulligan RC: Genetically engineered cytotoxic T cells targeted against angiogenesis: a novel anti-tumor strategy. American Association of Neurological Surgeons – 66th Annual Meeting (Philadelphia, Pennsylvania, April, 1998).
2. **Ghogawala Z**, Carter BS, Niederman T, Mulligan RC: Genetically Engineered cytotoxic T cells targeted against angiogenesis as a novel brain tumor therapy. Angiogenesis and Brain Tumor Therapy – NABTT Meeting (Tampa, Florida, May, 1998).
3. **Ghogawala Z**, Mansfield FL, Borges, LF: Early spinal radiation adversely affects surgical outcome for symptomatic metastatic spinal cord compression. Congress of Neurological Surgeons – Annual Meeting (Seattle, Washington, October, 1998).

4. **Ghogawala Z**, Carter BS, Niederman T, Mulligan RC: Genetically engineered anti-angiogenic T cells: a novel therapy for brain tumors. American Academy of Neurological Surgeons – Annual Meeting (Amelia Island, Florida, November, 1999).
5. **Ghogawala Z**, Niederman T, Carter BS, Mulligan RC: Anti-tumor activity of cytotoxic T lymphocytes genetically engineered to target endothelial growth factor receptors. Yale VBT/ IPCT Seminar (New Haven, Connecticut, December, 2001).
6. Amin-Hanjani S, **Ghogawala Z**, Shahid K, Stabile L, Carter BS, Ogilvy, CS: Carotid restenosis: the effect of statins. American Association of Neurological Surgeons/ Congress of Neurological Surgeons - Cerebrovascular Section Meeting (San Diego, California, February, 2004).
7. **Ghogawala Z**, Benzel EC, Amin-Hanjani S, Barker FG, Harrington JF, Magge SN, Strugar J, Bartolomei J, Coumans JV, Borges LF: Prospective comparison of surgical outcomes after laminectomy with or without instrumented fusion for lumbar stenosis with grade I spondylolisthesis. American Association of Neurological Surgeons Annual Meeting (Orlando, Florida, May, 2004).
8. **Ghogawala Z**, Benzel EC, Amin-Hanjani S, Barker FG, Harrington JF, Magge SN, Strugar JG, Bartolomei J, Coumans, JV, Butler WE, Borges LF: Lumbar Stenosis SLIP Study: Prospective comparison of surgical outcomes with or without instrumented fusion for lumbar stenosis with grade I spondylolisthesis. New England Neurosurgical Meeting (Boston, Massachusetts, June, 2004)
9. **Ghogawala Z**, Benzel EC, Amin-Hanjani S, Barker FG, Coumans JV, Harrington JF, Magge SN, Strugar J, Bartolomei J, Borges LF, Butler WE: Evaluation of randomization in the SLIP study: a prospective, multicenter trial. New England Neurosurgical Meeting (Hartford, Connecticut, September, 2004).
10. **Ghogawala Z**, Benzel EC. Spinal Experts' Review significantly increases patient consent to randomization in the SLIP study: an ongoing prospective, multicenter surgical trial. 58th Annual Meeting of the Neurosurgical Society of America (Orlando, Florida, June, 2005).
11. **Ghogawala Z**, Benzel EC, Amin-Hanjani S, Harrington JF, Coumans JV, Magge SN, Strugar J, Bartolomei J, Dempsey P, Borges LF, Sonntag VK, Butler WE, Barker FG: Spinal Experts' Review significantly increases patient consent to randomization in the SLIP study: An ongoing prospective, multi-center surgical trial. Congress of Neurological Surgeons Annual Meeting (Boston, Massachusetts, October, 2005).
12. Barker FG, Coumans JV, Benzel EC, Stabile LM, **Ghogawala Z**: Understanding barriers to neurosurgical randomized clinical trials: community equipoise, individual surgeon equipoise, and willingness to randomize for a complex surgical decision. Congress of Neurological Surgeons Annual Meeting (Boston, Massachusetts, October, 2005).
13. **Ghogawala Z**, Coumans JV, Benzel EC, Stabile LM, Barker FG: Defining eligibility for a randomized clinical trial (RCT) of ventral versus dorsal decompression for cervical spondylotic myelopathy (CSM): Cervical Spine Research Society (CSRS) Survey Results. Cervical Spine Research Society Annual Meeting (San Diego, California, December, 2005).
14. **Ghogawala Z**, Abbed K, Coumans JV, Barker FG: Lumbar fusion surgery in the United States, 1993-2003: A market share analysis. American Association of Neurological Surgeons Annual Meeting (San Francisco, California, April, 2006).

15. **Ghogawala Z**, Stabile LM, Westerveld M, Amin-Hanjani S: Flow-limited carotid stenosis patients might experience less cognitive injury after carotid revascularization than normal flow patients. Outcomes (The Key West Meeting) in Cardiac and Vascular Surgery 11th Annual Meeting (Barbados, May, 2007).
16. **Ghogawala Z**, Potter R, Wasserberger E, Barker FG: Ventral surgery versus dorsal decompression with fusion for cervical spondylotic myelopathy: equipoise and cost analysis. New England Neurosurgical Society Meeting (Newport, Rhode Island, September, 2007).
17. **Ghogawala Z**, Christopher S, Stabile LM, Amin-Hanjani S, Poullis M: Effect of Extracranial Carotid Characteristics and Revascularization on Cerebral Blood Flow assessed by qMRA. New England Neurosurgical Society Meeting (Newport, Rhode Island, September, 2007).
18. **Ghogawala Z**, Wasserberger E, Potter, R, Barker FG: Ventral surgery versus dorsal decompression with fusion for cervical spondylotic myelopathy: A cost analysis. American Association of Neurological Surgeons Annual Meeting (Chicago, Illinois, April, 2008).
19. **Ghogawala Z**, Bernstein E, Stabile LM, Christopher S, Amin-Hanjani S: The effect of carotid endarterectomy on cerebral blood flow. International Stroke Conference (San Diego, California, February, 2009).
20. **Ghogawala Z**, Benzel EC, Magge SN, Abbed KM, Apfelbaum R, Bisson EF, Shahid J, Coumans JVC, Choudhri TF, Butler WE, Barker FG, Heary RF: Comparative Effectiveness of Ventral versus Dorsal surgery for cervical spondylotic myelopathy. AANS-CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting (Orlando, FL, February, 2010).
21. **Ghogawala Z**, Stabile LM, Westerveld M, Berenstein A, Langer D, Amin-Hanjani S: The effect of improving cerebral blood flow on cognitive function after carotid endarterectomy. Congress of Neurological Surgeons Annual Meeting (San Francisco, California, October, 2010).
22. **Ghogawala Z**, Benzel EC, Magge SN, Coumans JV, Harrington JF, Barker FG: Lumbar spinal fusion reduces risk of re-operation after laminectomy for lumbar spinal stenosis associated with grade I spondylolisthesis: Initial results from the SLIP trial. Congress of Neurological Surgeons Annual Meeting (San Francisco, California, October, 2010).

E. Recent Poster Presentations

1. **Ghogawala Z**, Christopher S, Stabile LM, Amin-Hanjani S, Poullis M: Extracranial carotid plaque length and parent vessel diameter significantly affects baseline ipsilateral intracranial blood flow. Stroke Meeting (New Orleans, Louisiana, February, 2008).
2. Westerveld M, Stabile LM, Langer D, Berenstein A, Amin-Hanjani S, **Ghogawala Z**: Improved cognitive function after carotid endarterectomy. American Academy of Clinical Neuropsychology Annual Meeting (Chicago, Illinois, June, 2010).

F. Invited Editorials

1. Benzel, EC, **Ghogawala Z**, Heary RF: Complications in spinal surgery: honesty in the best policy. World Neurosurgery (in press).
2. **Ghogawala Z**, Benzel EC, Schlenk R: Bone Morphogenetic Protein – A case for evidence and for common sense. Congress Quarterly (in press).

G. Grand Rounds Presentations and Invited Lectures

1. **Ghogawala, Z**: “Lumbar Stenosis and Grade I Spondylolisthesis: Does Fusion Improve Outcomes?” Neurosurgical Grand Rounds, Yale University School of Medicine, May 8, 2002.
2. **Ghogawala, Z**: “Lumbar Stenosis and Grade I Spondylolisthesis: Does Fusion Improve Outcomes?” Neurosurgical Grand Rounds, Massachusetts General Hospital, February 20, 2003.
3. **Ghogawala Z and Benzel, EC**: “Lumbar Stenosis and Grade I Spondylolisthesis: Does Fusion Improve Outcomes?” Neurosurgical Grand Rounds, Cleveland Clinic Foundation, October 27, 2003.
4. **Ghogawala, Z**: “Spinal Surgery Outcomes: The Rationale and Design for Randomized, Prospective Clinical Trials Comparing Surgical Procedures” Neurosurgical Grand Rounds, Lahey Clinic, March 23, 2005.
5. **Ghogawala Z and Barker FG**: “Cervical Spondylotic Myelopathy: The Rationale and Design for a Randomized, Prospective Clinical Trial” Neurosurgical Grand Rounds, Massachusetts General Hospital, July 7, 2005.
6. **Ghogawala Z**: “The rationale and clinical design of multi-center, randomized clinical trials of the degenerative spine: the SLIP and CSM studies.” Whitcomb Lecture, New England Neurosurgical Society, Southbridge, Massachusetts, January 20, 2006.
7. **Ghogawala Z**: “Carotid endarterectomy, intracranial flow, and cognitive outcome.” International Symposium on Flow Measurement in Cerebrovascular Surgery, Chicago, Illinois, October 6, 2006.
8. **Ghogawala Z**: “The rationale and design for multi-center randomized controlled trials in community neurosurgery”. Neurosurgical Grand Rounds, Yale University School of Medicine, November 29, 2006.
9. **Ghogawala Z**: “Effect of extracranial carotid revascularization on cerebral blood flow assessed by quantitative MRA.” 2nd International Symposium on Flow Measurement in Cerebrovascular Surgery, San Diego, September 14, 2007.
10. **Ghogawala Z**: “Unique funding mechanisms for clinical trials in neurosurgery.” Congress of Neurological Surgeons Annual Meeting, San Diego, California, September 17, 2007.
11. **Ghogawala Z**: “Neurosurgical randomized trials: Designing feasible and fundable clinical research.” Neurosurgical Grand Rounds, University of Illinois at Chicago, November 17, 2007.
12. **Ghogawala Z**: “Rationale and design for a multi-center randomized controlled trial comparing ventral and dorsal surgery for cervical spondylotic myelopathy” US Spine Masters Course, Al Cordoba Institute, Dubai, February 19, 2008.
13. **Ghogawala Z**: “Is there a best surgical therapy for CSM? Pool Lectureship, Columbia University, December 4, 2009.

14. **Ghogawala Z:** “Comparative effectiveness research for lumbar spinal stenosis – ‘to fuse or not to fuse’”, Department of Medicine, Greenwich Hospital, July 20, 2010.