

## CURRICULUM VITAE

**Joel Goodman Pickar, DC, PhD**  
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### Education and training

2015-Present	Professor Emeritus, Dept Biomedical Engineering University of Iowa
2012-Present	Professor Emeritus, Palmer Center for Chiropractic Research Palmer College of Chiropractic
2012-2014	Adjunct Professor, Dept Biomedical Engineering University of Iowa
2005-2012	Professor, Palmer Center for Chiropractic Research Palmer College of Chiropractic
1999-2012	Adjunct Associate Professor, Dept Biomedical Engineering University of Iowa
1999-2004	Associate Professor, Palmer Center for Chiropractic Research Palmer College of Chiropractic
1999	Associate Professor, Anatomy & Physiology College of Veterinary Medicine, Kansas State University
1998-2001	Adjunct Assistant Professor, Dept. of Molecular Biosciences University of Kansas
1993-1999	Assistant Professor, Anatomy & Physiology College of Veterinary Medicine, Kansas State University
1993	Assistant Research Physiologist, Cardiovascular Medicine University of California, Davis
1990	Post-doctoral Research Fellow, Cardiovascular Medicine University of California, Davis
1990	Ph.D., Physiology, University of California, Davis
1977	D.C., Chiropractic, Palmer College of Chiropractic; Davenport, Iowa
1973	B.A., Human Studies Brown University; Providence, Rhode Island

### Teaching Experience

2006, 2007, 2009	Sensory Neurophysiology (C620), Biomechanical & Neurophysiology Approaches to Basic Science Spinal Investigations (C640/A610), Survey of Chiropractic Research (C521, CLIN51521) Independent Study (C640) Palmer Center for Chiropractic Research, Davenport, IA
1993-1999	Veterinary Physiology College of Veterinary Medicine, Kansas State University, Manhattan
1989-1990	Medical student physiology remedial tutoring, School of Medicine, University of California, Davis
1988-1990	Laboratory exercises in Human Physiology School of Medicine, Office of Curricular Support, University of California, Davis
1984-1986	Teaching Assistant: Physiology, Analysis of Vertebrate Structure, Introduction to Biology, and Embryology for undergraduate students University of California, Davis
1978	Instructor: Spinal Anatomy Pacific States Chiropractic College; San Lorenzo, CA

### Honors and Awards

2013	Fellow, Palmer Academy of Chiropractic, Palmer College of Chiropractic, Davenport
2006	Invited Convocation Speaker, Graduation Awards Convocation, Class 061, Palmer

2005	College of Chiropractic, Davenport Outstanding Faculty of the Year, Palmer College of Chiropractic, Davenport
2005	3 <sup>rd</sup> Prize winner for original research at 8 <sup>th</sup> Biennial Congress of the World Federation of Chiropractic
2004	Researcher of the Year, American Chiropractic Association
2003	Thelma Fordyce-Mack Faculty Award, Palmer Chiropractic Univ., Davenport
1989	Phi Sigma Honor Society, University of California, Davis
1978	Who's Who in American Colleges and Universities
1977	Pi Tau Delta Honor Society, Palmer College of Chiropractic
1973	Graduation with Honors, Brown University
1969	New York State Regents Scholarship

### **Committee and Professional Service**

2012	Reviewer, PlosOne, BMC Musculoskeletal, The Spine Journal
2011	Reviewer, Journal of Biomechanics, JMPT, Physiotherapy Theory and Practice, The Spine Journal
2010	Peer reviewer for protocols submitted to Animal Care Committee at Canadian Memorial Chiropractic College, Toronto, Ontario.
2010	Invited Reviewer, Research Foundation - Flanders (Belgium) (FWO).
2010	Invited Session Chair, Human and Animal Models of chronic back pain. Workshop on Deconstructing Back Pain National Institutes of Health May 10 – 11.
2005-2012	Promotions Committee, Professorial level, Palmer Chiropractic College, Davenport, IA
2004-2007	Member, NIH Advisory Council for Complementary and Alternative Medicine (NCCAM)
2003-2012	Library Committee, Palmer Chiropractic College, Davenport, IA
2001-Present	The Spine Journal, Associate Board Member
2001-2012	Student's Research and Special Topics Club Co-Advisor:
2005	Reviewer, North American Research Conference on Complementary and Integrative Medicine, Edmonton, Canada, May 24-27
2005	Co-Leader for Neuroscience Section, Conference on the Biology of Manual Therapies, sponsored by NIH/NCCAM, Bethesda, Maryland, June 9-10
2004	ACC-RAC Peer Review Committee.
2002	Workshop Co-Organizer: Mechanisms-based Research in Chiropractic; Association of Chiropractic Colleges and National Workshop to Develop the Chiropractic Research Agenda VII (ACC/RAC VII), March 13-16.
2001-2006	Reviewer: ACC ChiroLoan Scholarship Program. Administered by New York Chiropractic College.
2001-2002	Journal of the Neuromusculoskeletal System: Associate Editor
2000	Grievance Committee, Palmer College of Chiropractic, Davenport, IA
2000	Ad hoc Reviewer, Special Emphasis Panel, National Center for Complementary and Alternative Medicine, National Institutes of Health
1999	Ad hoc Reviewer, Respiratory and Applied Study Section, National Institutes of Health
1998	Search Committee, Faculty position, Department Anatomy and Physiology, Kansas State University
1998	Ad hoc Reviewer, Geriatrics and Rehabilitation Study Section, National Institutes of Health
1998	Reviewer, NIH sponsored Consortial Center for Chiropractic Research
1997	Invited participant to National Workshop to Develop the Chiropractic Research Agenda, Sponsored by U.S. Dept of Health & Human Services Health Resources & Services Administration (HRSA) Washington, D.C.
1996	Invited observer to National Workshop to Develop the Chiropractic Research Agenda, Sponsored by U.S. Dept of Health & Human Services Health Resources & Services Administration (HRSA), Contract #240-95-0036, Washington, D.C.
1996	Member, Concept Clearance Review Panel to establish a Chiropractic Research Center, National Institutes of Health

1994-1996	Graduate Program Executive Committee – Chairperson, Kansas State University, Manhattan, KS
1989-1995	Clinical Advisory Panel, Spinal Manipulation: A Review of the Current Literature, Foundation for Chiropractic Education and Research.
Past Reviewer	American Journal of Physiology, Brain Research Interactive, Experimental Brain Research, Journal of Applied Physiology, Journal of Neurophysiology, Journal of Neuromusculoskeletal Research, Medicine and Science in Sports and Exercise, Pain, Research in Veterinary Science, Spine, The Spine Journal, Clinical Orthopaedics & Related Research, Life Sciences, Journal of Biomechanics, Chiropractic and Osteopathy, Journal of Manipulative and Physiological Therapeutics

### **Professional Associations:**

1996-2012	Society for Neuroscience, Member
1992-2012	American Physiological Society, Associate Member
1977-2012	California Chiropractic License #12015
1993-1995	American Association for the Advancement of Science, Member

### **Grants & Fellowships**

2007-2012	Principal Investigator National Center for Complementary and Alternative Medicine (NIH/NCCAM) 1U19AT004137 Title: Developmental Center to Study Mechanisms & Effects of Chiropractic Manipulation
2007-2012	Co-Leader National Center for Complementary and Alternative Medicine (NIH/NCCAM) 1U19AT004137 (recommended for funding, funding pending) Title: Developmental Center to Study Mechanisms & Effects of Chiropractic Manipulation Project Title: Neural & Biomechanical Responses to Mechanical Features of Spinal Manipulation
2003-2007	Principal Investigator National Institutes of Neurological Disease and Stroke (NINDS) R01 NS046818 Project Title: Vertebral position alters muscle spindle sensitivity
2003-2006	Co-Leader National Center for Complementary and Alternative Medicine (NIH/NCCAM) U19 AT002006 Title: Mechanisms and Effects of Chiropractic Manipulation Project Title: Effect of vertebral loading on facet joint capsule
2003-2006	Co-Leader National Center for Complementary and Alternative Medicine (NIH/NCCAM) U19 AT002006 Title: Mechanisms and Effects of Chiropractic Manipulation Project Title: Effect of vertebral loading on sympathetic nerve regulation
2002-2007	Co-Investigator National Center for Complementary and Alternative Medicine (NIH/NCCAM) K30 AT00977

	Title: K-30:Chiropractic clinical research curriculum
2001-2003	Principal Investigator National Center for Complementary and Alternative Medicine (NIH/NCCAM) R21 AT00676 Project Title: Does spinal manipulation speed determine neural response
2000-2001	Principal Investigator National Center for Complementary and Alternative Medicine (NIH/NCCAM) U01 AT00170 Project Title: Changes in paraspinal muscle spindle sensitivity
2000-2002	Principal Investigator National Institutes of Health (Complementary and Alternative Medicine) U01 AT00170 Project Title: Effect of spinal loading on sympathetic nerve regulation
1998-2000	Principal Investigator Foundation for Chiropractic Education and Research Identifying Number Unknown Project Title: Neurophysiological responses to lumbar facet movement
1997-2000	Principal Investigator National Institutes of Health, (Neurological Disease and Stroke) R01 NS35300 Project Title: Neurophysiological consequences of lumbar facet movement
1997-2002	Co-Investigator National Institutes of Health, (Arthritis, Musculoskeletal and Skin) U01 AT00170 Project Title: Creating the consortial center for chiropractic research
1997-1999	Co-Principal Investigator American Heart Association, Kansas Affiliate Identifying Number Unknown Project Title: Down-regulation of Na <sup>+</sup> pumps in skeletal muscle of rats with chronic heart failure
1995-1997	Principal Investigator American Heart Association, Kansas Affiliate KS-95-GB-4 Project Title: Cardiac-mediated inhibition of skeletal muscle activity
1994-1995	Principal Investigator Deans Research Fund, Kansas State University No Identifying Number Project Title: Brainstem localization of vagal sensory endings from the cardiopulmonary region using c-fos (Fos) expression
1993-1996	Principal Investigator: First Award National Institutes of Health R29 HL49221 Project Title: Mechanism of Exercise Inhibition During Lung Congestion

- 1992-1993 Co-Investigator: Zimmer Research Grant  
Orthopedic Research and Education Foundation  
92-008  
Project Title: Mechanoreceptor innervation of spinal facets: neurosensory input in health & disease
- 1990-1993 Fellowship: National Research Service Award  
National Institutes of Health  
F32 HL 08144  
Project Title: Muscle afferents and cardiovascular reflexes during exercise
- 1983-1986 Fellowship  
Foundation for Chiropractic Education and Research  
#83-64

## **Publications**

### **JOURNALS (76 total)**

- 1990 Spier SJ, Carlson GP, Holliday TA, Cardinet III GH, Pickar JG. Hyperkalemic periodic paralysis in horses. *Journal of the American Veterinary Medical Association*, 197(8):1009-1017.
- 1991 Pickar JG, Spier SJ, Snyder JR, Carlsen RC. Altered ionic permeability in skeletal muscle from horses with hyperkalemic periodic paralysis. *American Journal of Physiology*, 260:C926-C933.
- 1991 Pickar JG, Atrakchi A, Gray SD, Carlsen RC. Apparent upregulation of Na<sup>+</sup>, K<sup>+</sup> pump sites in SHR skeletal muscle with reduced transport capacity. *Clinical and Experimental Hypertension*, A13(5):645-652.
- 1992 Pickar JG, Gray SD, Carlsen RC. Appearance of  $\alpha$ 1-adrenergic receptor in soleus muscles from SHR. *American Journal of Physiology*, 262:C1284-1291.
- 1992 Hill JM, Pickar JG, Kaufman MP. Attenuation of reflex pressor and ventilatory responses to static contraction by an NK-1 receptor antagonist. *Journal of Applied Physiology*, 73:1389-1395.
- 1992 Hill JM, Pickar JG, Parrish MD, Kaufman MP. Effects of hypoxia on the discharge of group III and IV muscle afferents in cats. *Journal of Applied Physiology*, 73:2524-2529.
- 1993 Pickar JG, Hill JM, Kaufman MP. Stimulation of vagal afferents inhibits locomotion in mesencephalic cats. *Journal of Applied Physiology*, 74:103-110.
- 1993 Pickar JG, Spier SJ, Harrold D, Carlsen RC. <sup>3</sup>H-ouabain binding in muscle from horses with hyperkalemic periodic paralysis. *American Journal of Veterinary Research*, 54:783-787.
- 1993 Sinoway LI, Hill JM, Pickar JG, Kaufman MP. Effects of contraction and lactic acid on the discharge of group III muscle afferents in cats. *Journal of Neurophysiology*, 69:1053-1059.
- 1994 Pickar JG, Hill JM, Kaufman MP. Dynamic exercise stimulates group III muscle afferents. *Journal of Neurophysiology*, 71:753-760.
- 1994 Pickar JG, Carlsen RC, Gray SD, Atrakchi A. Increased Na<sup>+</sup>-K<sup>+</sup> pump number and decreased pump activity in soleus muscles in SHR. *American Journal of Physiology*, 267:C836-844.
- 1994 Hill JM, Pickar JG, Kaufman MP. Blockade of non-NMDA receptors attenuates the reflex pressor

- response to static contraction. *American Journal of Physiology*, 266:H1769-H1776.
- 1995 Pickar JG and McLain RF. Responses of mechanosensitive afferents to manipulation of the lumbar facet in the cat. *Spine*, 20(22):2379-2385.
- 1995 Hirai T, Musch TI, Morgan DA, Kregel KC, Claasen DE, Pickar JG, Lewis SJ, Kenney MJ. Differential sympathetic nerve responses to nitric oxide synthase inhibition in anesthetized rats. *American Journal of Physiology*, 269:807-813.
- 1996 Carlsen RC, Gray SD, Pickar JG. Na<sup>+</sup>, K<sup>+</sup> pump activity and skeletal muscle contractile deficits in the spontaneously hypertensive rat. *Acta Physiologica Scandinavica*, 156(3):237-245.
- 1997 Pickar JG. The coronary chemoreflex evoked by intrapericardial nicotine has a somatic component. *American Journal of Physiology*, 272:H827-H834.
- 1997 Pickar JG. Chemical stimulation of cardiac receptors attenuates locomotion in mesencephalic cats. *Journal of Applied Physiology*, 83(1):113-119.
- 1997 Pickar JG, Mattson J, Lloyd S, Musch TI. Decreased [<sup>3</sup>H]-ouabain binding sites in skeletal muscle of rats with chronic heart failure. *Journal of Applied Physiology*, 83(1):323-329.
- 1998 Pickar JG. The thromboxane A2 mimetic U46619 inhibits somatomotor activity via a vagal reflex from the lung. *American Journal of Physiology*, 275:R706-719.
- 1998 McLain RF and Pickar JG. Mechanoreceptor endings in human thoracic and lumbar facet joints. *Spine*, 23(2):168-173.
- 1999 Pickar JG. An in vivo preparation for investigating neural responses to controlled loading of a lumbar vertebra. *Journal of Neuroscience Methods*, 89:87-96.
- 2000 Kenney MJ, Pickar JG, Weiss ML, Saindon CS, Fels RJ. Effects of midbrain and spinal cord transections on sympathetic nerve responses to heating. *American Journal of Physiology*, 278(5):R1329-38.
- 2000 Goggin JM, Biller DS, Debey BM, Pickar JG, Mason D. Ultrasonic measurement of gastrointestinal wall thickness and the ultrasonographic appearance of the ileocolic region in healthy cats. *Journal of the American Animal Hospital Association*, 36:224-28.
- 2001 Pickar JG and Wheeler JD. Response of muscle proprioceptors to spinal manipulative-like loads in the anesthetized cat. *Journal of Manipulative and Physiological Therapeutics*, 24(1):2-11.
- 2001 Pickar JG. Healthcare in the 21st Century - Neurophysiologic issues of the subluxation lesion. *Topics in Clinical Chiropractic*, 8(1):9-15.
- 2001 Pickar JG and Kang YM. Short-lasting stretch of lumbar paraspinal muscles decreases muscle spindle sensitivity to subsequent muscle stretch. *Journal of the Neuromusculoskeletal System*, 9(3):88-96
- 2001 Kang YM, Wheeler JD, Pickar JG. (corresponding author). Stimulation of chemosensitive afferents from multifidus muscle does not sensitize multifidus muscle spindles to vertebral loads in the lumbar spine of the cat. *Spine*, 26(14):1528-1536.
- 2001 Bub GA, Budgell BS, Henderson CNR, Injeyan HS, Kinsinger S, Moltz JH, Pickar JG, Polus BI, Song X, Vernon H. Neuroscience in the Chiropractic Curriculum. *Journal of the Neuromusculoskeletal System*, 9(3):77-81.

- 2002 Pickar JG. Neurophysiological effects of spinal manipulation. *The Spine Journal*, 2:357-371.
- 2002 Kang Y-M, Choi WS, Pickar JG (corresponding author). Electrophysiological evidence for an intersegmental reflex pathway in lumbar paraspinal tissues. *Spine*, 27(3):E56-E63.
- 2002 Musch TI, Wolfram S, Hageman KS, Pickar JG. Skeletal muscle ouabain binding sites are reduced in rates with chronic heart failure. *Journal of Applied Physiology*, 92(6):2326-34.
- 2002 Kaufman MP, Hayes SG, Adreani CM, Pickar JG. Discharge properties of group III and IV muscle afferents. *Advances in Experimental Medicine and Biology*, 508:25-32.
- 2003 Kang YM, Kenney MJ, Spratt KF, Pickar JG (corresponding author). Somatosympathetic reflexes from the low back in the anesthetized cat. *Journal of Neurophysiology*, 90:2548-2559.
- 2005 DeVocht JW, Pickar JG, Wilder DG. Spinal manipulation alters EMG activity of paraspinal muscles – a descriptive study. *Journal of Manipulative and Physiological Therapeutics*, 28(7):465-471.
- 2005 Sung PS, Kang YM, Pickar JG (corresponding author). Effect of spinal manipulation duration on low threshold mechanoreceptors in lumbar paraspinal muscles: a preliminary report. *Spine*, 30(1):115-122.
- 2005 Ge W, Long CR, Pickar JG (corresponding author). Vertebral position alters paraspinal muscle spindle responsiveness in the feline spine: effect of positioning duration. *Journal of Physiology*, 569(Pt 2):655-65.
- 2006 Pickar JG, Kang YM. 3<sup>rd</sup> Prize Winner: Paraspinal muscle spindle responses to the duration of a spinal manipulation under force control. *Journal of Manipulative and Physiological Therapeutics*, 29(1):22-31.
- 2006 Owens EF Jr, Henderson CN, Gudavalli MR, Pickar JG (corresponding author). Head repositioning errors in normal student volunteers: a possible tool to assess the neck's neuromuscular system. *Chiropractic & Osteopathy*, 14:5.
- 2006 Cramer G, Budgell B, Henderson C, Khalsa P, Pickar JG. Basic Science Research Related to Chiropractic Spinal Adjusting: The State of the Art and Recommendations Revisited. *Journal of Manipulative and Physiological Therapeutics*, 29(9):726-61.
- 2007 Pickar JG, Sung PS, Kang Y-M, Ge W. Response of lumbar paraspinal muscles spindles is greater to spinal manipulative loading compared with slower loading under length control. *The Spine Journal* 7(5):583-95.
- 2007 Goldenberg LR, Owens EF, Pickar JG. Recruitment of research volunteers: methods, interest and incentives. *Journal of Chiropractic Education*, 21(1):28-31.
- 2007 Wiese, GC, Percuoco, RE, Pickar, JG, Duray, SM, Faruqui, SR, Schmiedel, GO, McLean, ID. Development of an evidence-based application and rubric for evaluating applicants' qualifications for promotion to professor. *Journal of Manipulative and Physiological Therapeutics*, 30(7):527-535.
- 2007 Ianuzzi A, Pickar JG, Khalsa PS. Determination of torque-limits for human and cat lumbar spine specimens during displacement-controlled physiological motions. *The Spine Journal*, 9(1):77-86.
- 2008 Ge W, Pickar JG (corresponding author). Time course for the development of muscle history in lumbar paraspinal muscle spindles arising from changes in vertebral position. *The Spine Journal*, 8(2):320-8.

- 2008 Guo Y Yao FR, Cao DY, Pickar JG, Zhang Q, Wang HS Zhao Y. Somatostatin inhibits activation of dorsal cutaneous primary 3 afferents induced by antidromic stimulation of primary 4 afferents from an adjacent thoracic segment in the rat. *Brain Research* 1229:61-71.
- 2009 Cao DY, Pickar, JG (corresponding author), Ge W, Ianuzzi A, Khalsa PS. Position sensitivity of feline paraspinal muscle spindles to vertebral movement in the lumbar spine. *Journal of Neurophysiology* 101(4):1722-9.
- 2009 Cao DY and Pickar JG (corresponding author). Thoracolumbar fascia does not influence sensory signaling from lumbar paraspinal muscle spindles: a neurophysiological study in the cat. *Journal of Anatomy*, 215(4):417-24.
- 2009 Cao DY, Khalsa PS, Pickar JG (corresponding author). Dynamic responsiveness of lumbar paraspinal muscle spindles during vertebral movement in the cat. *Experimental Brain Research*, 197(4):369-77.
- 2009 Wang J, Guo Y, Cao DY, Luo R, Ma SJ, Wang HS, Pickar JG, Zhao Y. Tonic inhibition of somatostatin on C and A $\delta$  afferent fibers in rat dorsal skin in vivo. *Brain Research*, 1288:50-9.
- 2010 Ianuzzi A, Pickar JG, Khalsa PS, Validation of the cat as a model for the human lumbar spine during simulated high-velocity, low-amplitude spinal manipulation. *Journal of Biomechanical Engineering*, 132(7):071008.
- 2010 Vaillant M, Pickar JG, Kawchuk GN. Performance and reliability of a variable rate, force/displacement application system. *Journal of Manipulative and Physiological Therapeutics*, 33(8):585-593.
- 2010 Luo R, Guo Y, Cao DY, Pickar JG, Li L, Wang J, Zhao Y. Local effects of octreotide on glutamate-evoked activation of A $\delta$  and C afferent fibers in rat hairy skin. *Brain Research*, 1322:50-58.
- 2011 Cao DY, Pickar JG (corresponding author). Lengthening but not shortening history of paraspinal muscle spindles in the low back alters their dynamic sensitivity. *Journal of Neurophysiology*, 105(1):434-441.
- 2011 Ianuzzi A, Pickar JG, Khalsa PS. Relationships between joint motion and facet joint capsule strain during cat and human lumbar spinal motions. *Journal of Manipulative and Physiological Therapeutics*, (7):420-31.
- 2011 Ge W, Cao DY, Long CR, Pickar JG (corresponding author). Plane of vertebral movement eliciting muscle lengthening history in the low back influences the decrease in muscle spindle responsiveness of the cat. *Journal of Applied Physiology*, 111(6):1735-43.
- 2011 Wang J, Cao DY, Guo Y, Ma SJ, Luo R, Pickar JG, Zhao Y. Inhibition of octreotide on the capsaicin-induced activation of C and A $\delta$  afferent fibers in rat hairy skin in vivo. *Clinical and Experimental Pharmacology and Physiology*, 38(8):521-527.
- 2011 Hubbard T, Pickar JG, Lawrence DJ. Radiograph measured distance between the atlas vertebra's transverse process and the mastoid process: implications for palpation and chiropractic technique. *Journal of Manipulative and Physiological Therapeutics*, 35(6):477-485.
- 2012 Pickar JG and Bolton PS. Spinal manipulative therapy and somatosensory activation. *Journal of Electromyography and Kinesiology*, 22(5):785-794.
- 2012 Colloca CJ, Pickar JG, Slosberg M. Special focus on spinal manipulation. *Journal of Electromyography and Kinesiology*, 22(5):629-31.



- 2012 Ge W and Pickar JG (corresponding author). The decreased responsiveness of lumbar muscle spindles to a prior history of spinal muscle lengthening is graded with the magnitude of change in vertebral position. *Journal of Electromyography and Kinesiology*, 22(6):814-820.
- 2013 Vaillant M, Edgecombe T, Long C, Pickar JG, Kawchuk GN. The effect of duration and amplitude of spinal manipulative therapy on the spinal stiffness. *Manual Therapy*, 17(6):577-583.
- 2013 Reed WR, Cao DY, Long CR, Kawchuk GN, Pickar JG (corresponding author). Relationship between biomechanical characteristics of spinal manipulation and neural responses in an animal model: effect of linear control of thrust displacement versus force, thrust amplitude, thrust duration, and thrust rate. *Evidence Based Complementary and Alternative Medicine*, E pub 2013 Jan 20, doi: 10.1155/2013/492039.
- 2013 Cao DY, Reed WR, Long CR, Kawchuk GN, Pickar JG (corresponding author). Effects of thrust amplitude and duration of high-velocity, low-amplitude spinal manipulation on lumbar muscle spindle responses to vertebral position and movement. *Journal of Manipulative and Physiological Therapeutics*, 36(2):68-77.
- 2013 Reed WR, Cao DY, Ge W, Pickar JG. Using vertebral movement and intact paraspinal muscles to determine the distribution of intrafusal fiber innervation of muscle spindle afferents in the anesthetized cat. *Experimental Brain Research*, 225(2):205-215.
- 2013 Edgecombe TL, Kawchuk GN, Long, CR, Pickar JG. The effect of application site of spinal manipulative therapy (SMT) on spinal stiffness. *The Spine Journal*, Oct 16, [Epub ahead of print] doi: 10.1016/j.spinee.2013.07.480.
- 2013 Reed WR, Long CR, Pickar JG. Effects of unilateral facet fixation and facetectomy on muscle spindle responsiveness during simulated spinal manipulation in an animal model. *Journal of Manipulative and Physiological Therapeutics*, 36(9):585-94.
- 2014 Reed WR, Long CR, Kawchuk GN, Pickar JG (corresponding author). Neural responses to the mechanical parameters of a high-velocity, low-amplitude spinal manipulation: effect of preload parameters. *Journal of Manipulative and Physiological Therapeutics*, 37(2):68-78.
- 2014 Cao DY, Pickar JG (corresponding author). Effect of spinal manipulation on the development of history-dependent responsiveness of lumbar paraspinal muscle spindles in the cat. *Journal of the Canadian Chiropractic Association*, 58(2):149-159.
- 2014 Reed WR, Pickar JG, Long CR. Effect of changing lumbar stiffness by single facet joint dysfunction on the responsiveness of lumbar muscle spindles to vertebral movement. *Journal of the Canadian Chiropractic Association*, 58(2):160-169.
- 2014 Reed WR, Pickar JG, Sozio RS, Long CR. Effect of spinal manipulation thrust magnitude on trunk mechanical activation thresholds of lateral thalamic neurons. *Journal of Manipulative and Physiological Therapeutics*, 37(5):277-286.
- 2014 Reed WR, Sozio R, Pickar JG, Onifer SM. Effect of spinal manipulation thrust duration on trunk mechanical activation thresholds of nociceptive-specific lateral thalamic neurons. *Journal of Manipulative and Physiological Therapeutics*, 37(8):552-560.
- 2015 Reed WR, Long, CR, Kawchuk, GN, Pickar JG (corresponding author). Neural responses to the mechanical parameters of a high velocity, low amplitude spinal manipulation: effect of specific contact site. *Manual Therapy* Mar 27. pii: S1356-689X(15)00061-2. doi: 10.1016/j.math.2015.03.008.
- 2015 Reed WR, Pickar JG. Paraspinal muscle spindle response to intervertebral fixation and segmental thrust level during spinal manipulation in an animal model. *Spine* Apr 8. [Epub ahead of print].

- 2015 Reed WR, Liebschner MAK, Sozio RS, Pickar JG, Gudavalli MR. Neural response during a mechanically assisted spinal manipulation in an animal model: a pilot study. *Journal of Novel Physiotherapy and Physical Rehabilitation*, 2(3):121-128.
- 2015 Hubbard T, Lawrence D, Duray S, Pickar JG. Reliability of the Blair Upper Cervical Radiographic Analysis for the Base Posterior View: A Feasibility Study. *Chiropractic & Manual Therapies* (in review).

#### INVITED COMMENTARY

- 2009 Meeusen R, Nakamura FY, Perandini LA, Proske U, Nybo L, Scano GL, Williamson JW, Pickar JG, Eston R, Haas F, Smith SA. Commentaries on Viewpoint: Perception of effort during exercise is independent of afferent feedback from skeletal muscles, heart, and lungs. *Journal of Applied Physiology* 106(6):2063-6.

#### BOOK CHAPTERS (9 total)

- 1993 Kaufman, MP, Hill, JM, Pickar, JG, Rotto, DM. Responses of Group III and IV muscle afferents to mechanical and metabolic stimuli likely to occur during exercise. In: Speck, DF, Frazier, DT, Dekin, MS, Revelette, WR. (eds). *Modulation of Respiratory Pattern: Peripheral and Central Mechanisms*. The University of Kentucky Press:Lexington. pp.120-124.
- 2003 Leach, R and Pickar, JG. Segmental dysfunction: Joint and muscle pathology and facilitation. In: Leach, R. (ed). *The Chiropractic Theories*, 4th ed. Lippincott, Williams and Wilkins:PA,. Chapter 9, pp.137-234.
- 2004 Pickar JG. Sensory Innervation of the Spine. In: Haldeman, S., Meeker, W., Budgell, B., Nilsson, N., Hooper, P. and Triano, J. (eds.). *Principles and Practice of Chiropractic*, 3rd ed. McGraw-Hill Co.:NY. Part II, Ch 12, pp.225-247.
- 2006 Pickar JG. Research on Spinal Physiology. In: Rakel D, Faass N, (eds). *Complementary Medicine in Clinical Practice*. Sudbury, MA: Jones and Bartlett Pub:MA, Chapter 51, pp.373-381.
- 2008 Pickar JG. Chiropractic science: Toward understanding spinal manipulation, In: Fuhr, A. (ed.). *The Activator Method*, 2<sup>nd</sup> ed. Mosby, Elsevier:MO, Section I, Chapter 2, pp.26-33.
- 2008 Cao DY, Zhao Y, Guo, Y. Pickar JG. Glutamate receptors involved in the interaction between peripheral nerve terminals. In: Paley, B.F., Warfield, T.E. (ed). *Amino Acid Receptor Research*, Nova Science Pub., Inc :NY, Chapter 11, pp.307-327
- 2010 Pickar JG, Kenney MJ, Henderson CNR, Gudavalli, MR. Somatosympathetic Reflex Mechanisms. In: King, H.H, Jänig, W. and Patterson, M.M. (eds.). *The Science and Clinical Application of Manual Therapy*. Elsevier:Amsterdam, Chapter 3. pp.55-69.
- 2013 Pickar JG. Proprioceptive contributions from paraspinal muscle spindles to the relationship between control of the trunk and back pain. In: Hodges PW, Cholewick J, Van Dieen H. *Spinal Control, 1st ed. The Rehabilitation of Back Pain*, Churchill Livingstone, Chapter 13.
- 2013 Brumagne S, Dolan P, Pickar JG. What is the relation between proprioception and low back pain? (Summary chapter 4). In: Hodges PW, Cholewicki J, Van Dieen JH. *Spinal Control, 1st ed. The Rehabilitation of Back Pain*, Churchill Livingstone, Chapter 19.

#### ABSTRACTS

- 1984 Pickar JG. The nerve supply of vertebral joints. *Proceedings Conference on Current Topics in Chiropractic: Reviews of the Literature*. Coyle, B.A., ed. May 19-20, Palmer College of Chiropractic-West, Sunnyvale, CA.

- 1988 Pickar J, Wildman M, Klein HW, Carlsen, R.C. Comparison of the sciatic function index (SFI) and functional recovery of denervated muscle following nerve transection. 33rd Annual Meeting Plastic Surgery Research Council, pp. 203-205.
- 1988 Pickar JG, Carlsen RC, Gray SD. Ipha adrenergic receptors in soleus muscles from SHR may stimulate Ca<sup>+++</sup>-activated K<sup>+</sup> channels. FASEB Journal, 2:A968.
- 1989 Pickar . and Carlsen R. The effect of aging on motor function in previously denervated muscles. Proceedings of the 1989 Conference on Spinal Manipulation. pp.92-96. Foundation for Chiropractic Education and Research: VA.
- 1989 Pickar JG, Carlsen RC, Gray SD. Impaired Na<sup>+</sup> pump capacity and upregulation of pump number in skeletal muscles from spontaneously hypertensive rats (SHR). Society for Neuroscience Abstracts, 15:520.
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- 1994 Pickar JG, McLain RF. Facet joint mechanoreceptors: directional sensitivity in cat lumbar facets. Orthopedic Research Society, New Orleans, LA.
- 1996 Pickar JG Cardiac receptors attenuate exercise in mesencephalic cats. FASEB Journal, 10(3):A676.
- 1996 Pickar .G. and McLain, R.F. Group III and IV afferents in the lumbar spine respond to facet joint movement. National Workshop to Develop the Chiropractic Research Agenda. U.S. Health Resources and Services Administration. Contract #240-95-0036, July 12-14, Washington, D.C.
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- 1997 Pickar JG. An experimental preparation for investigating neural responses to facet joint movement. National Workshop to Develop the Chiropractic Research Agenda II. U.S. Health Resources and Services Administration. June 19-22, Alexandria, VA
- 1998 Pickar JG and Stephens LL. GABA-A receptors in the spinal cord contribute to the J reflex. Society for Neuroscience Abstracts 23(1):1004.

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- 1999 Kang YM, Wheeler JD, Pickar JG. Effects of bradykinin and capsaicin on responses of muscle spindle afferents to vertebral loads in the cat. *Society for Neuroscience Abstracts* 25(1):122.
- 1999 Wheeler JD and Pickar JG. The effects of spinal manipulation on the discharge of muscle spindle afferents National Workshop to Develop the Chiropractic Research Agenda IV. U.S. Health Resources and Services Administration. July 23-25, Chicago, IL.
- 2000 Wheeler JD and Pickar JG. The effects of spinal manipulative-like loads on the discharge of paraspinal muscle proprioceptors in anesthetized cats. Foundation for Chiropractic Education and Research, 2000 International Conference on Spinal Manipulation. Sept 21-23, Bloomington, MN
- 2000 Kang YM, Choi WS, Pickar JG. Electrophysiological evidence for a paraspinal intersegmental reflex in the lumbar vertebral column. *Society for Neuroscience Abstracts* 26(1):1143.
- 2001 Pickar JG and Kang YM, Kenney MJ. Sensory input from lumbar paraspinal tissues reflexly increases sympathetic nerve activity to spleen & kidney. *Alternative Therapies in Health and Medicine*, 7(3):S27-S28.
- 2001 Pickar J.G, Kang YM, Cobb T, Kenney M.J. Mustard oil injected into lumbar multifidus muscle increases sympathetic nerve activity to spleen and kidney via a suprasedgmental reflex. *Society for Neuroscience Abstracts*, Vol. 27, Program No. 818.9.
- 2001 Meeker W, Haw, C, Long C, Bronfor, G, Cramer G, Pickar J, Adams A. Hondras M, Haas M. Multidisciplinary collaboration and scientific integration: Role and progress of the Consortial Center for Chiropractic Research. 129th Annual Meeting of APHA.
- 2002 Pickar JG, Kang YM, Kenney MJ. Inflammation of lumber multifidus muscle reflexively increases sympathetic nerve activity to spleen and kidney. *Joint Proceedings of the Association of Chiropractic Colleges and National Workshop to Develop the Chiropractic Research Agenda VII (ACC/RAC VII)*, New Orleans, March 13-16, *Journal of Chiropractic Education* 16(1):44-45.
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- 2002 Pickar .G. and Kang YM. Proprioceptive errors from lumbar paraspinal muscle spindles – might they be a component of the chiropractic subluxation? *Proceedings of the 2002 International Conference on Spinal Manipulation*, Toronto, CA, October 4-5, pg 72-73.
- 2003 DeVocht, JW, Pickar JG, Wilder DG. Reduction of elevated paraspinal EMG activity following spinal manipulation. *World Federation of Chiropractic 7th Biennial Conference*, Orlando, FL, May 1-3, p.223-225.
- 2003 Pickar JG, Kang YM, Kenney MJ, Spratt KF. Muscle inflammation and vertebral loading in the low back reflexively increases autonomic activity in the anesthetized cat. *The International Society for the Study of the Lumbar Spine*, Vancouver, Canada, May 13-17.
- 2003 DeVocht JW, Pickar JG, Wilder DG. Effect of spinal manipulation on paraspinal muscle activity. *The*

International Society for the Study of the Lumbar Spine, Vancouver, Canada, May 13-17.

- 2004 Pickar JG, Sung PS, Kang YM. The effect of a spinal manipulation's impulse speed on low threshold mechanoreceptors in lumbar paraspinal muscles. Association of Chiropractic Colleges Educational Conference XI /Research Agenda Conference IX Las Vegas, Nevada ~ March 11 – 13, 2004, Journal of Chiropractic Education 18(1):25-26.
- 2004 Ge W, Cobb T, Pickar JG. Changes in lumbar paraspinal muscle spindle response due to the history of vertebral position. Society for Neuroscience, Presentation Number 672.13.
- 2004 Pickar JG, Kang YM, Cobb T. Discharge of paraspinal muscle spindles to impulse loading of a spinal manipulation. Society for Neuroscience, Presentation Number 672.18.
- 2005 Ge W and Pickar JG. Static vertebral position alters lumbar paraspinal muscle spindle sensitivity. Association of Chiropractic Colleges Educational Conference X /Research Agenda Conference X. In: The Journal of Chiropractic Education, 9(1):9.
- 2005 Pickar JG. and Kang YM. Paraspinal muscle spindle responses to the duration of a spinal manipulation under force control. Congress Proceedings of the World Federation of Chiropractic's 8<sup>th</sup> biennial Congress. June 16-18, 2005, Sydney, Australia, p183-184.
- 2005 Ge W and Pickar JG. Change of paraspinal muscle spindle resting discharge evoked by mechanical vibration. 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Sept 1 – 4, Shanghai, China.
- 2005 G, W, Cobb T, Pickar JG. Small changes in lumbar vertebral position alter paraspinal muscle spindle responsiveness. Society for Neuroscience. November 12-16, Washington, DC. Program No. 869.1. 2005 Abstract Viewer/Itinerary Planner
- 2005 Ianuzzi A, Pickar JG, Khalsa PS. Torque limits of feline lumbar spine specimens during displacement-controlled physiological motions. Biomedical Engineering Society Annual Meeting, Sept 28-Oct 1, Baltimore, MD.
- 2006 Pickar JG and Ge W. Short-lasting changes in vertebral position alter lumbar paraspinal muscle spindle sensitivity. Association of Chiropractic Colleges Educational Conference /Research Agenda Conference (AXCC/RAC), March 16-18, Washington DC.
- 2006 Pickar JG and Ge W. Classification of muscle spindles in the lumbar spine of the anesthetized cat. Society for Neuroscience. November 14-18, Atlanta, GA. Program No. 650.3. 2006 Abstract Viewer/Itinerary Planner.
- 2006 Cao DY, Pickar JG, Ge W, Ianuzzi A, Khalsa, PS. Changes in lumbar facet joint capsule strain and paraspinal muscle spindle discharge during vertebral movement in the anesthetized cat. Society for Neuroscience. November 14-18, Atlanta, GA. Program No. 650.1. 2006 Abstract Viewer/Itinerary Planner
- 2006 Ge W, Cao D, Pickar JG. Very small changes in vertebral position evoke muscle history dependent changes in paraspinal muscle spindle discharge. Society for Neuroscience. November 14-18, Atlanta, GA. Program No. 650.2. 2006 Abstract Viewer/Itinerary Planner.
- 2006 Owens EF Jr, Henderson CN, Gudavalli MR, Pickar JG. Head repositioning errors in normal student volunteers: a possible tool to assess the neuromuscular system of the neck. Association of Chiropractic Colleges Educational Conference /Research Agenda Conference (ACC/RAC), March 16-

- 18, Washington DC.
- 2007 Ge W and Pickar JG. Directional effect of vertebral position on muscle spindle responsiveness at L<sub>6-7</sub> segments. Association of Chiropractic Colleges Educational Conference /Research Agenda Conference (ACC/RAC), March 15-17, Phoenix, AZ.
- 2007 Cao DY, Pickar JG, Ge W., Ianuzzi A, Khalsa PS. Relationship between lumbar facet joint capsule strain and paraspinal muscle spindle discharge during vertebral movement. Association of Chiropractic Colleges Educational Conference /Research Agenda Conference (ACC/RAC), March 15-17, Phoenix, AZ.
- 2007 Wiese G, Percuoco RE, Duray SM, Faruqui SR, McLean .D, Pickar JG, Schmiedel GO. Striving for Transparency: Development of an Evidence-Based Application and Rubric used for Evaluating Applicants' Qualifications for Promotion to Professor . Association of Chiropractic Colleges Educational Conference /Research Agenda Conference (ACC/RAC), March 15-17, Phoenix, AZ.
- 2007 Pickar JG, Cao DY, Ge W, Ianuzzi A, Khalsa PS. Sensitivity of paraspinal muscle spindles to intervertebral position in the cat lumbar spine. Society for Neuroscience. November 3-7, San Diego, CA. Program No. 410.9 Abstract Viewer/Itinerary Planner.
- 2007 Cao DY, Pickar JG, Ge W, Ianuzzi A, Khalsa PS. Sensitivity of paraspinal muscle spindles to the velocity of intervertebral movement in the cat lumbar spine. Society for Neuroscience. November 3-7, San Diego, CA. Program No. 41010 Abstract Viewer/Itinerary Planner,
- 2007 Ge W, Cao DY, Pickar JG. Resting discharge of paraspinal muscle spindles is stable under deep anesthesia using sodium pentobarbital. Society for Neuroscience. November 3-7, San Diego, CA. Program No. 727.14 Abstract Viewer/Itinerary Planner.
- 2007 Ianuzzi A, Pickar JG, Khalsa PS. Validation of the Cat as a Biomechanical Model of the Human Lumbar Spine," Poster No. 1073, 53<sup>rd</sup> Annual Meeting of the Orthopaedic Research Society, San Diego, CA, February 11–14.
- 2008 Pickar JG, Cao DY, Ge W. The responsiveness of lumbar paraspinal muscle spindles is affected by the history of vertebral position along 3 orthogonal axes of vertebral motion. Society for Neuroscience. November 15-19, Washington, DC Program No. 181.11 Abstract Viewer/Itinerary Planner.
- 2008 Cao DY and Pickar JG. Removing lumbodorsal fascia does not affect the development of muscle history-dependent responsiveness in lumbar paraspinal muscle spindles. Society for Neuroscience. November 15-19, Washington, DC Program No. 181.10 Abstract Viewer/Itinerary Planner.
- 2009 Cao DY and Pickar JG. Lumbodorsal fascia does not affect passive signaling properties of lumbar paraspinal muscle spindles. 2nd International Fascia Research Congress. Amsterdam, The Netherlands, October 27-30. Fascia Research II, Hujing, P.A., Hollander, P., Findley, T.W., and Schleip, R. (eds). Abstract # 7.2.2, p 247.
- 2009 Cao DY and Pickar JG. The effect of spinal manipulative thrusts on the development of muscle history-dependent responsiveness of lumbar paraspinal muscle spindles. North American Research Conference on Complementary and Integrative Medicine, May 12-15, Minneapolis, MN, Alternative Therapies. 15(3),S81, #2869.
- 2009 Reed WR, Cao DY, Pickar JG. An in vivo spinal joint hypo- and hypermobility model for investigating paraspinal afferent feedback. Society for Neuroscience. Oct 17-21, Chicago, IL Program No. 80.3 Abstract Viewer/Itinerary Planner.
- 2009 Cao DY and Pickar JG. The effect of the velocity of vertebral actuation in muscle history protocols on sensory signaling from lumbar paraspinal muscle spindles. Society for Neuroscience. Oct 17-21,

- Chicago, IL. Program No. 80.4 Abstract Viewer/Itinerary Planner.
- 2010 Reed WR, Cao DY, Kawchuk GN, Pickar JG. Effects of manipulation's mechanical characteristics (magnitude and duration) on paraspinal muscle spindle discharge. Society for Neuroscience. Nov 13-17, San Diego, CA. Program No. 182.17 Abstract Viewer/Itinerary Planner.
- 2010 Cao DY, Reed WR, Kawchuk GN, Pickar JG. Effects of thrust displacements simulating a spinal manipulation on the response of lumbar paraspinal muscle spindles to ramp and hold movement. Society for Neuroscience. Nov 13-17, San Diego, CA. Program No. 182.1 Abstract Viewer/Itinerary Planner.
- 2010 Wilder DG, Owens E, Gudavalli MR, Macken RD, Xia T, Vining R, Pohlman K, Corber L, Meeker W, Goertz C, Pickar JG. Pelvic repositioning in low back pain patients. 3<sup>rd</sup> American Conference on Human Vibration, June 1-4, Iowa City, IA.
- 2010 Gudavalli MR, DeVocht J, Xia T, Tayh A, Meeker W, Pickar J, Goertz C, Wilder D, Owens E, Henderson C., Goel V, Qin YX, Lim TH, Kenney M, Patwardhan A, Rowell R, Vining R, Havey R, Voronov L, Ianuzzi A, Macken D, Struckman S. Biomechanics core and research laboratories at a chiropractic research center: Its functions and contributions in federally funded research grants. ASME International Mechanical Engineering Congress & Exposition, Vancouver, British Columbia, 12-18 Nov 2010.
- 2010 Byrd L, Long CR, Zhang L, Cooperstein R, Pickar JG, Henderson C. Mentored research opportunities for students in a doctor of chiropractic program. Association of Chiropractic Colleges Educational Conference (ACC), March 17-19, Las Vegas NV.
- 2011 Pickar JG, Reed WR, Cao DY, Kawchuk GN. Effect of the mechanical characteristics (magnitude and duration) of a spinal manipulative thrust on lumbar paraspinal muscle spindle discharge. Association of Chiropractic Colleges Educational Conference (ACC), March 17-19, Las Vegas NV.
- 2011 Reed WR and Pickar JG. Effects of changes in intersegmental stiffness on muscle spindle responsiveness to dynamic loading. 35<sup>th</sup> Annual MidWest Pain Society, Oct. 28-29, Chicago, IL.
- 2012 Pickar JG, Reed WR, Long CR, Kawchuk GN. OA04.03. Neural responses to the mechanical characteristics of a spinal manipulation: effect of varying direction of the applied thrust force. BMC Complementary and Alternative Medicine 12(Suppl 1):O15.
- 2012 Pickar JG, Reed WR, Long CR, Kawchuk GN. Neural responses to the mechanical characteristics of a spinal manipulation: effect of varying segmental contact site. International Research Congress on Integrative Medicine & Health, May 15-18, Portland, OR.
- 2012 Reed WR and Pickar JG. Effects of unilateral facet fixation and facetectomy on muscle spindle responsiveness during simulated spinal manipulation. International Research Congress on Integrative Medicine & Health, May 15-18, Portland, OR.
- 2012 Reed W, Pickar JG. P01.25. Classification of L6 muscle spindle afferents in the anesthetized cat. BMC Complementary and Alternative Medicine 12(Suppl 1):P25.
- 2012 Edgecombe TL, Kawchuk GN, Long CR, Pickar JG. Biomechanical responses to the mechanical characteristics of a spinal manipulation: effect of varying segmental contact site. International Research Congress on Integrative Medicine & Health, May 15-18, Portland, OR.
- 2012 Xia T, Gudavalli R, Qin Y, Goel V, Ianuzzi-Morris A, Pickar J. Loading rate during spinal manipulation has minimal effect on lumbar spine peak reaction force and spinal stiffness: a human specimen study. 36<sup>th</sup> Annual American Society of Biomechanics Meeting, Aug 15-18, Gainesville, FL.

- 2014 Reed WR, Pickar JG. Effects of instrument assisted spinal manipulation on lumbar muscle spindle response in an animal model. International Research Congress on Integrative Health & Medicine, Miami, FL.
- 2014 Reed WR, Sozio R, Pickar JG, Onifer SM. Effect of spinal manipulation thrust duration on trunk mechanical activation thresholds of nociceptive specific lateral thalamic neurons. International Research Congress on Integrative Health & Medicine meeting Miami, FL.

**Invited presentations at national/international meetings:**

- 1997 Pickar JG. A collaborative research project. National Workshop to Develop the Chiropractic Research Agenda II. U.S. Health Resources and Services Administration. June 19-22, Alexandria, VA
- 1998 Pickar JG. The long and winding road. Grantsmanship Lessons:, Experiences of Chiropractic Researchers. National Workshop to Develop the Chiropractic Research Agenda III. U.S. Health Resources and Services Administration, Contract # 240-95-0036, Consortial Center for Chiropractic Research under agreement U24AR5166 with NIH . June 19-22, Alexandria, VA
- 1999 Pickar JG. Membrane Transport Abnormalities in skeletal muscle in SHR. Symposium: Effect of Cardiovascular Disease on the Structure and Function of Skeletal Muscle. Experimental Biology, April 17-21, Washington, DC.
- 2000 Pickar JG. Status report on research in chiropractic: Neuroscience research. Research Agenda Conference: Chiropractic IV: Research: Implications for Practice, Policy and Professional Development. U.S. Health Resources and Services Administration. July 23-25, Arlington Park, Ill
- 2001 Pickar JG. Neurological approaches to researching the subluxation and adjustment: Effect of subluxation/adjustment on peripheral joint and muscle receptors. . Research Agenda Conference: Chiropractic VI: Advancing the Science of Chiropractic. U.S. Health Resources and Services Administration. July 27-29, Kansas City, MO
- 2002 Pickar JG, Kang YM, Wheeler JD. Paraspinal muscle spindles responses to biomechanical changes in the spine. Fourth World Congress of Biomechanics, August 4-9th Calgary, Alberta, Canada.
- 2003 Pickar JG. Workshop Co-Organizer: Mechanisms-based Research in Chiropractic; Association of Chiropractic Colleges and National Workshop to Develop the Chiropractic Research Agenda VII (ACC/RAC VII), March 13-16, New Orleans, LA.
- 2004 Pickar JG. Manipulation versus mobilization: is there any difference?: Neurophysiological Aspects. Workshop Co-Organizer: Mechanisms-based Research in Chiropractic; Association of Chiropractic Colleges and National Workshop to Develop the Chiropractic Research Agenda VIII (ACC/RAC VIII), March 11-14, Las Vegas, NV.
- 2005 Pickar JG. The Road to Scientific Funding. Association of Chiropractic Colleges and National Workshop to Develop the Chiropractic Research Agenda (ACC/RAC 2005), March 17-19, Las Vegas, NV.
- 2005 Pickar JG. Basic Science Research Agenda. Association of Chiropractic Colleges and National Workshop to Develop the Chiropractic Research Agenda (ACC/RAC 2005), March 17-19, Las Vegas, NV.
- 2005 Pickar JG. Leveraging funding for chiropractic research in North America: Opportunities through the United States National Institutes of Health (NIH). Australian Spinal Research Foundation. June 18, 2005, Sydney, Australia.
- 2005 Pickar JG. Sensory input and manual therapies: effects of non-noxious mechanical stimuli on primary afferent neurons from deep tissue. Conference on the Biology of Manual Therapies, NIH/NCCAM, Bethesda, Maryland, June 9-10.



- 2007 Pickar JG. Sensory nerves from lumbar paraspinal muscles are sensitive to vertebral position and to spinal manipulation. The Spine Care Revolution, Vancouver, British Columbia, Canada, April 27-28.
- 2007 Pickar, J.G. Physiology of the Lumbar Spine and Spinal Manipulation. Distinguished Seminar on CAM Interventions. NIH/NCCAM's National Advisory Council. Bethesda, MD, Sept 3.
- 2008 Pickar JG. Somatosympathetic Reflexes Initiated from Paraspinal Tissues . International Research Symposium: Somato-Visceral Interactions and Autonomic Mechanisms of Manual Therapy, March 31-April 1, University of North Texas Health Science Center in Fort Worth, Texas, USA.
- 2009 Pickar JG. Does Basic Science Research in Complementary and Integrative Medicine Need Standards and Guidelines? CHIROPRACTIC. North American Research Conference on Complementary and Integrative Medicine, May 12-15, Minneapolis, MN.
- 2009 Pickar JG. Relationship Between Control of the Trunk and Back Pain. Spinal Control 2009: Biomechanical and neurophysiological aspects of control of the trunk and their relevance for pain and disability, CCRE Spine, The University of Queensland, Australia, Nov. 12-14.
- 2011 Pickar JG. Spinovisceral Reflexes: From Paraspinal Tissues to Autonomic Effects. American Osteopathic Research Conference. The Science Supporting the Impact of OMT on the Human Condition: The Structure-Function Relationship and Mechanisms of Action for Self-Regulatory and Healing Processes. Oct 30 – Nov 1, Orlando, FL.
- 2012 Pickar JG. Muscle Spindles in Lumbar Paraspinal Muscles :Their Physiology & Responses to Spinal Manipulation Using Manual and Conventional Therapies to Enhance Musculoskeletal Health. The Osteopathic Research Center, University of North Texas Health Science Center April, 27-29, Fort Worth, Texas.
- 2013 Pickar JG. Problems and Solutions in CAM Therapies: Manipulative Therapies. Preconference Workshop: "Complementary and Alternative Medicine: Roles in Chronic Pain Medicine and Research", 32<sup>nd</sup> Annual Scientific Meeting of the American Pain Society, May 8-11, New Orleans, LA.

#### **Other Invited presentations**

- 2005 Australian Spinal Research Foundation, Sydney, Australia
- 2005 Homecoming, Palmer, Davenport
- 2004 Homecoming, Palmer, Davenport
- 2003 Lyceum, Palmer, Davenport
- 2003 Northwestern Health Sciences University
- 2001 University of Bridgeport College of Chiropractic
- 2001 Lyceum, Palmer, Davenport
- 2001 New York College of Chiropractic
- 2000 Lyceum West, Palmer West, San Jose
- 1999 Lyceum, Palmer, Davenport