

ONE PAGE SUMMARY

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e-mail: rsherman@nwinet.com **website:** www.biofeedbacktraining.org

Highest degree & Training:

Ph.D. in Psychobiology, New York University, Bronx, N.Y., 1973

Post Doctoral Clinical on-the-job training, seminars and courses in psychophysiological treatment techniques: VA Hospital, San Antonio, 1975 -78

Certified in general and pelvic floor biofeedback

Experience - Total of 40 years experience doing research and teaching

Present Positions:

Director, Psychophysiology Doctoral Program, School of Clinical Psychology, Saybrook University, San Francisco, CA 1 July, 2013 - present

Director, Behavioral Medicine Research and Training Foundation, Suquamish, Washington, January, 2000 - present.

Teaching: Current courses include research design and analysis, psychophysiology of pain, psychobiology / biopsychology, psychophysiological interventions, behavioral interventions for urinary incontinence, anatomy & physiology, CAM, and survey of psychology. Previous courses include general psychology, environmental science, drugs & behavior, etc.

Research has been supported by GRANTS from the National Institutes of Health (NIH), the Department of Veterans Affairs (VA), the U.S. Army (open competition with universities), Private Industry, and non-profit groups. History of continuous funding.

2. Previous positions include (a) Director of Research and Professor; Behavioral Physiology Institutes, Bainbridge Washington. July, 1998 - December, 1999, (b) Chief of Surgical Research, Madigan Army Medical Center, 1994 - 1998, (c) Director of Orthopedic Research at Fitzsimons Army Medical Center, 1987 - 1994, (d) Chief of Investigative Psychology at DD Eisenhower Army Medical Center, 1980 - 1987, (e) Director, Behavioral Assessment Laboratory, US Army Environmental Hygiene Agency, 1978 - 1980, and (f), six others.

Research / Discoveries best known for:

- a. Identification of physiological mechanisms causing phantom limb pain, surveys on occurrence of phantom limb and stump pain, and development of treatments for these disorders.
- b. Development of ambulatory recording techniques leading to determination of relationships between headache, low back pain, and muscle tension in subject's normal environments.
- c. Treatment of migraine headaches with pulsing electromagnetic fields.

Publications: 131 publications and 2 accepted for publication. Includes 46 articles in peer reviewed journals, 8 chapters, 4 booklets, and three books. Most of the publications relate to clinical studies of pain evaluation and treatment.

CURRICULUM VITAE - RICHARD A. SHERMAN, Ph.D.

July, 2013

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EDUCATION AND TRAINING

B.A. Psychobiology, Hunter College, Bronx, N.Y., 1967

M.S. Psychobiology and Animal Behavior, New York University and the American Museum of Natural History, New York, N.Y., 1969

Ph.D. Psychobiology and Ethology, New York University, Bronx, N.Y., 1973

Programming and Immunology: Armed Forces Inst. of Pathology, Wash DC, 1969 - 71

Post Doctoral Clinical on-the-job training, seminars and courses in psychophysiological treatment techniques: VA Hospital, San Antonio, 1975 -78

RESEARCH / DISCOVERIES BEST KNOWN FOR:

1. Identification of physiological mechanisms causing phantom limb pain, surveys on occurrence of phantom limb and stump pain, and development of treatments for these disorders.
2. Development of ambulatory recording techniques leading to determination of relationships between headache, low back pain, and muscle tension in subject's normal environments.
3. Treatment of migraine headaches with pulsing electromagnetic fields.
4. Pervasiveness, physiology, and treatment of stress urinary incontinence among female soldiers.

RESEARCH AND PROFESSIONAL EXPERIENCE

a. Present Positions:

1. Director, Psychophysiology Doctoral Program, School of Clinical Psychology, Saybrook University, San Francisco, CA 1 July, 2013 - present. Duties include development of the program, recruiting and supervising faculty, running the program, teaching courses, and supervising students.

2. Director, Behavioral Medicine Research and Training Foundation, Port Angeles, Washington, January, 2000 - present. Duties include directing the Foundation (plan the program, recruit instructors, work with students, raise funds, etc.). Teach formal courses in behavioral medicine areas and supervise student research. Supervise student research and chair thesis and dissertation committees.

3. UNITEK Nursing College: Part time teaching in the RN program 2011 – present.

b. Teaching: Current courses include research design and analysis, psychophysiology of pain, psychobiology / biopsychology, psychophysiological interventions, behavioral interventions for urinary incontinence, anatomy & physiology, complimentary and alternative medicine, and general biofeedback. Previous courses include general psychology, environmental science, drugs & behavior, etc.

c. Grant support: See GRANT section on page five for details of grant funding - has been from the National Institutes of Health (NIH), the Department of Veterans Affairs (VA), the U.S. Army (open competition with universities), Private Industry, and non-profit groups.

d. Editing & Reviewing: Member of the Editorial Board of *Applied Psychophysiology and Biofeedback*. Review articles for Pain, Clinical Journal of Pain, and other journals.

Guest editor of three special issues of the journal Biofeedback: (1) sEMG recording (1999), (2) Instrumentation (Spring 2002), and (3) Pelvic floor disorders (2006).

PREVIOUS POSITIONS

1. Dean, Psychophysiology Doctoral Program, University of Natural Medicine, Santa Fe, New Mexico, January, 2003 – May, 2013. Duties include development of the program, recruiting and supervising faculty, running the program, teaching courses, and supervising students.

2. Editor, Web site for the Association for Applied Psychophysiology and Biofeedback, Wheat Ridge, CO, 2004 – December 2008. Chair of Web Site Committee, March 2012 - present.

3. Part time instructor, Chapman University, California. Teach internet based courses in research, physiological psychology, and seminar in psychology. Jan 2000 – 2005.

4. Director of Research and Professor, Behavioral Physiology Institutes, Bainbridge Washington. July 1998 - December, 2000. Left position when school stopped giving courses. Duties included being academic director from June – December 2000. Taught courses in pain assessment and intervention, somatic nervous system, etc. Assisted students in development of dissertation projects.

5. Chief, Surgical Research Service, Department of Surgery, Madigan Army Medical Center, Tacoma, Washington. August 1994 - July, 1998 (then chief consultant for surgical research until September, 2003). Health Services Research Physiologist / Psychologist (68J/T) Skill level identifier "A" (Equivalent to a full professor in a civilian institution.); Lieutenant Colonel, Medical Service Corps, US Army.

Duties included: Directed the Psychophysiology Laboratory at Madigan Army Medical Center. Chaired the medical center's pain management team. Clinical work included diagnosis and treatment of difficult pain patients; Trained Orthopedic and General Surgery Residents in clinical and basic research techniques. Mentored the residents through all phases of their research projects.; Developed and performed studies in support of Orthopedics oriented toward:

- (a) evaluation and treatment of chronic pain
- (b) clinical use of psychophysiological devices.

Trained graduate students, interns, residents, technicians, and staff in the use of psychophysiological recording equipment and techniques as well as aid in its use with clinical and research populations. Provided formal courses in applied psychophysiology.

6. Director of Orthopedic Research, Orthopedic Surgery and Chief of Psychophysiology and Clinical Biometrics Service, Department of Clinical Investigation, Fitzsimons Army Medical Center, Aurora, Colorado. June 1987 - July, 1994.

a. Duties included: (1) Directed the Psychophysiology Laboratory at Fitzsimons Army Medical Center. Average yearly budget = \$407,400; (2) Developed and performed studies in support of Orthopedics oriented toward: (a) evaluation and treatment of chronic pain and (b) clinical use of psychophysiological devices; (3) Teaching: Trained graduate students, interns, residents,

technicians, and staff in the use of psychophysiological recording equipment and techniques as well as aid in its use with clinical and research populations. This specifically included providing formal courses in applied psychophysiology; (4) Provided research design and analysis support to all students and staff doing research at Fitzsimons Army Medical Center and regional military hospitals. This included being the research design and analysis consultant for the regional Human Research and Animal Use Committees at Fitzsimons AMC; (5) Directed the Medical Center's Reflex Sympathetic Dystrophy Clinic.

b. Positions concurrent with the Fitzsimons position: (1) Without compensation appointment in Research Service at the Denver VAMC; (2) Assoc. Professor, Department of Rehabilitation Medicine University of Colorado Health Science Center at Denver: Taught seminars in evaluation, treatment, and mechanisms of chronic pain to residents.

c. Undergraduate teaching while stationed at Fitzsimons AMC:

- (1) University of Colorado at Denver - (a) Cognitive Psychology
(b) Drugs and Behavior
- (2) Community College of Aurora - Introductory Psychology course and mscl. lectures
- (3) Association for Applied Psychophysiology - Instrumentation for Applied Psychophysiology

6. Chief of the Investigative Psychology and Biostatistics Service in the Department of Clinical Investigation, DD Eisenhower Army Medical Center, Ft. Gordon, GA, October 1980 - June 1987. Duties similar to those described for Chief of Psychophysiology above. This position did not include being Director of Research for Orthopedics and was at a much smaller institution. The difference is equivalent to being a staff officer for a large Division after having a parallel job at a small Battalion.

Concurrent Positions: (a) Associate Professor, Medical College of Georgia
(b) Director, Joint Army - VA Pain Lab in Augusta, GA.

7. Director, Behavioral Assessment Laboratory, Toxicology Division, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, Maryland. July 1978 - September 1980. Health Services Research Psychobiologist - Captain, Medical Service Corps, US Army. Duties included:

- a. Direct the Behavioral Assessment Laboratory. Supervise enlisted technicians and civilian scientists in the behavioral laboratory.
- b. Develop and carry out methods for evaluating behavioral effects of chemicals used in the military environment (i.e. insect repellents) both independently and in conjunction with other elements of Toxicology Division.
- c. Computerize Toxicology Division's data gathering and analysis system. Analyze results of tests and write reports of test results.

8. Research Physiologist (GS12), Psychiatry and Research Services, Audie L. Murphy Memorial Veterans Administration Medical Center, San Antonio, TX. January 1975 - April 1978. This position was funded only by grants. Left when opportunity to rejoin US Army arose. Duties included:

- a. Executive officer of the Psychophysiology Laboratory:
 - (1) Carried out administrative and support functions including program development and research proposal design.
 - (2) Trained professional staff from different services, residents, and students to apply biofeedback and relaxation techniques to their own clinical specialties and supervised student research.
 - (3) Coordinated the Southwest Center for Treatment of Chronic Phantom Limb Pain.
- b. Research:

Senior investigator: (1) Effectiveness of recorded relaxation exercises for chronic pain.
(2) Investigations of phantom limb pain.
(3) Non-treatment effects on pain.

- Co-Investigator: (1) Behavioral treatment of hypertension
 (2) Psychobiology of Grief
- c. Developed and performed treatments for:
- (1) Elimination of phantom limb pain.
 - (2) Reduction of tardive dyskinesia.
 - (3) Control of hypertension.
 - (4) Control of fecal incontinence.
 - (5) Reduction of tension headache.

Position concurrent with above position:

Assistant Professor, Department of Psychiatry, Medical School of the University of Texas Health Science Center at San Antonio, TX. Lectures to PM & R residents on (a) behavioral techniques for treatment of chronic pain and (b) etiology and treatment of phantom pain.

9. Assistant Professor, Department of Interdisciplinary Science and Science Education, Morgan State College, Baltimore, MD. Sept 1973 - Dec 1974. Position terminated due to staff reductions following enrollment drops and changes in college requirements.

Courses: Biological Science / Environmental Biology - lecture and laboratory.

Unsubstantiated Phenomena - honors course on how to analyze the credibility of data.

Research: Rodent Alarm Pheromones.

10. Adjunct Instructor, Department of Natural Sciences, York College, Queens, NY. January - June 1973. Temporary one term position.

Course: Ecology and Evolution (Environmental/behavioral biology) - lecture.

11. Teaching Fellowship, Department of Biology, New York University, Bronx, NY. September 1971 - June 1973.

Courses: Graduate and undergraduate laboratories in behavioral ecology, comparative physiology, ecology / field biology, and general biology.

Research: Behavioral and ecological aspects of hamster alarm pheromones.

12. Biological Sciences Research Assistant, Armed Forces Institute of Pathology, Washington, DC. Sept 1969 - 1971. Position terminated at the end of two years of active duty in the US Army.

Research: Immunological stains using horseradish peroxidase.

Analysis and identification of abnormal urine compounds.

13. Teaching Fellowship, Department of Biology, New York University, Bronx, NY. September 1968 - June 1969.

Course: General Biology Laboratory.

Research: Fish forebrain and behavior (American Museum of Natural History).

Mechanisms of fish schooling (New York Aquarium).

CLINICAL CERTIFICATIONS:

Biofeedback Certification Institute of America #543 – General Biofeedback Senior Fellow
 #p19 – Pelvic Muscle Dysfunction

HONORS AND AWARDS

New York University Special Founders Award for Highest Scholastic Preferment.

Elected member of Sigma Xi Society.

Honor lecturer at both New York University and Morgan State College.

US Army "A" skill level identifier (equivalent to getting full professor status).

Two Meritorious Service and two Army Commendation Medals for excellence in various aspects of US Army research including resident training, and soldier support.

Association for Applied Psychophysiology President's award for outstanding research.
 U S Army Medical Command Order of Military Medical Merit (highest award for contributions to the holder's profession in both the Army and the professional civilian community).

MEMBERSHIP IN SCIENTIFIC SOCIETIES

American Psychological Association

Association for Applied Psychophysiology and Biofeedback

(President 2013 - 2014)

(Chairman, Website Committee, 2012 – present)

(Chairman, Membership Committee 2010 – present)

(Web site editor 2004 – Dec 2008)

(President 2005-2006)

(Member, Board of Directors 1994 – 1997; 1998 – 2001, 2004 – 2007, 2012 - present)

(Chairman, Research Committee March 1995 – March 2003)

(Chairman, Research & Instrumentation Committee 1990 - March 1995)

(Chairman, Research Awards Committee 1990 - 1992)

(Chairman, Program Committee for 1993 and 2003 Annual Meetings)

(Chairman, Membership Committee, 2010 – present)

Surface EMG Society of North America (Now a division of the Assoc. for Applied Psychophysiology. (President, 1996 - 2000) (Member, Board of Directors, 1994 – present)

International Association for the Study of Pain

GRANTS

Completed grants:

a. Sherman, R. Morgan State College faculty research grant to investigate the ecology of rodent alarm pheromones, 1973.

b. Gaarder, K.; Koller, E.; Sherman, R., et al: Biofeedback and relaxation for treatment of hypertension. Three year VA grant, 1975.

c. Koller, E.; Sherman, R. et al: Psychobiology of normal and abnormal grief. Three year VA grant, 1976.

d. Sherman et al: Mechanisms of phantom limb pain, \$71,700 three year grant from the Veterans Administration, 1983.

e. Sherman R; Arena J: Evaluation of chronic low back pain. \$105,000, three year grant from the Veterans Administration. 1986.

f. Sherman R; Hahn D; Rondinelli R; et al: Mechanism based treatments of phantom limb pain. \$121,000 three year grant from the VA. 1987.

g. Sherman R; Place, D; Ginther, J: Etiology and progression of acute muscle tension related low back pain occurring during sustained activity including combat training exercises. \$421,000 five year grant from the US Army Medical R&D Command. 1989.

h. Sherman R; Karstetter K; Woerman A; Schaefer R et al: Use of heat patterns for predicting and evaluating low extremity pain among soldiers. \$457,000 five year grant from

Medical R&D Command. 1989.

i. Arena J and Sherman R: Reliability of Psychophysiological Measures Used to Evaluate Pain. \$382,000, three year grant from the Veterans Administration. 1991.

j. Sherman R and Karstetter K: Potentiation of normal healing of stress fractures using pulsing electromagnetic fields. Three year grant from EBI Medical Systems, Diapulse Corporation, and MRDC. 1991.

k. Sherman R, et al: Effectiveness of biofeedback for treatment of musculoskeletal low back pain and orofacial pain. Two year grant from the National Institutes of Health. Concurrent funding for administrative support from the Association for Applied Psychophysiology.

l. Sherman R and Jones C: Reduction of post-surgical swelling in the hands and feet using pulsing electromagnetic fields. One year grant from Diapulse Corporation. 1993.

m. Jones C and Sherman R (CO-PI): Effectiveness of pulsing electromagnetic fields for treatment of pelvic stress fractures. One & 1/2 year, \$80,290 grant from Congress through DOD, 1994.

n. Davis G and Sherman R (CO-PI): Evaluation of the performance impact and treatment of exercise induced urinary incontinence among female soldiers. One & 1/2 year, \$85,340 grant from Congress through DOD, 1994.

o. Powell JB and Sherman R (CO-PI): Effect of premenstrual syndrome and primary dysmenorrhea on women's cognitive functioning and job performance before and after biofeedback treatment. One year, \$44,000 grant from Congress through DOD, 1995.

p. Lauder T, Sherman R, Davis G, and Williams: The female athlete triad: Prevalence and characteristics among military women. One year, \$87,000 grant from Congress through DOD, 1996.

q. Davis G and Sherman R (CO-PI): Ambulatory recording of urodynamic functioning among female soldiers. Two year, \$129,255 grant from Congress through DOD, 1996.

r. Sherman R, Crane L: Determination of whether a pronation-correcting insole reduces the occurrence of lower limb pain among overpronating soldiers during basic training. One year \$50,300 grant from Schering-Plough through the Geneva Foundation, 1977.

s. Sherman R, Marden L, Flynn F: Headache treatment with pulsing electromagnetic fields used in the clinic. One year, \$10,000 grant from the National Headache Foundation, 1997.

t. Sherman R, Brencick M: Prevention of tension headaches with low level electrical stimulation: A placebo controlled pilot study. Six month, \$1,500 grant from alpha-stim, 1998.

u. Sherman R, Woerman A: Migraine prevention with pulsing electromagnetic fields used in the home. Two year, \$10,000 grant from the National Headache Foundation, 1998.

v. Sherman R, Woerman A: Treatment of migraine headaches using Magnatherm pulsed electromagnetic fields. One year, \$4,300 grant from Magnatherm. 1998.

w. Loan L, Sherman R (originator), et al: Relative effectiveness of behavioral interventions for urinary incontinence in female soldiers provided at the work site or hospital. Two year, \$120,000 (approximately) grant from the Department of Defense. 1999.

x. Clary K, Loan L, Sherman R, et al: Comparative effectiveness of home practice vs. in-

hospital treatments of behavioral interventions for urinary incontinence in female soldiers. Two year, \$115,000 grant from the Department of Defense. 2000.

y. Sherman R, Henderson N, et al: Use of overpronation controlling boot and sneaker inserts to prevent and reduce lower limb pain among overpronating soldiers. One year, \$33,500 grant from the Department of the Army. 2002.

PUBLICATIONS

1. Shaw E, Sherman R: The optomotor response of a forebrainless fish, *Tilapia mossambica*. Am. Mus. Novit. 2446, 1971.
2. Sherman R: Demonstration of a hamster alarm pheromone. Dissertation Abstracts 34(8): 74 - 1965, 1974.
3. Sherman R: Alarm transmission by odor in mammals. Pursuit 7(3): 70-71, 1974.
4. Sherman R: The need for controlled studies in biofeedback research. Proceedings of the sixth annual meeting of the biofeedback research society. 1975. (Abstract)
5. Gaarder K, Sherman R: Chapter entitled: Biofeedback in the treatment of neurological disease. In Clinical Biofeedback by Gaarder, K. and Montgomery, P., Williams and Wilkins, NY, 1976. (Contributor)
6. Gaarder K, Sherman R, Montgomery P: Chapter entitled: Advanced elements of treatment of chronic anxiety. In Clinical Biofeedback by Gaarder, K. and Montgomery, P., Williams and Wilkins, NY, 1976. (Contributor)
7. Sherman R: Case reports of treatment of phantom limb and stump pain with a combination of electromyographic biofeedback and verbal relaxation techniques. Biofeedback and Self-regulation 1(3): 353, 1976.
8. Sherman R, Mayfield D: Effects of the biofeedback environment on frontalis EMG level and blood pressure. Biofeedback and Self-Regulation 2(3): 310, 1977. (Abstract)
9. Gaarder K, Gormly J, Montgomery P, Sherman R: Clinical closure on effective methods of training essential hypertension. Biofeedback and Self-Regulation 2(3): 304, 1977. (Abstract)
10. Sherman R, Gaarder K, Huff R, Hayashi R, Williams M: Failure of intensive short-term relaxation training to reduce blood pressure of pregnant hypertensives or pre-eclamptics. Psychophysiology 15(3): 277, 1978. (Abstract)
11. Sherman R, Gall N, Gormly J: Treatment of phantom limb pain with muscular relaxation training to disrupt the pain-anxiety-tension cycle. Pain 6: 47 - 55, 1979.
12. Sherman R: Preliminary behavioral assessment of habituation to Permethrin. National Technical Information Service AD number A068700: 1 - 14, 1979.
13. Sherman R: Successful treatment of one case of tardive dyskinesia with electromyographic feedback form the masseter muscle. Biofeedback and Self-Regulation 4: 367 - 370, 1979.
14. Sherman R: Special review: Published treatments of phantom limb pain. Am. J. Physical Med. 59(5): 232 - 244, 1980.

15. Sherman R: Behavioral effects of acute aerosol exposure to N, N-Diethyl-M-Toluamide (M-DET). National Technical Information Service AD number A067939: 1 - 24, 1980.
16. Sherman R, Sherman C, Gall N: A survey of current phantom limb pain treatment in the United States. Pain 8: 85 - 99, 1980.
17. Sherman R: Behavioral effects of subchronic aerosol exposure of rats to N, N-Diethyl-M-Toluamide (M-DET). National Technical Information Service AD number A077163: 1 - 21, 1980.
18. Sherman R: Home use of tape recorded relaxation exercises as initial treatment for tension headache, borderline hypertension, and chronic anxiety. Military Medicine 141(12): 1062-1066, 1982.
19. Sherman R, Tippens J: Suggested guidelines for treatment of phantom limb pain. Orthopedics 5: 1595 - 1600, 1982.
20. Sherman R, Sherman C: Prevalence and characteristics of chronic phantom limb pain among American veterans. Am. J. Phys. Med. 62:227 -238, 1983.
21. Sherman R: Diagnosis and treatment of phantom limb pain: Mechanisms and option flow sheet. National Technical Information Service AD number A119789: 1 -11, 1982.
22. Bruno R, Sherman R: Applications of psychophysiological principles to psychotherapy. Proceedings AMED Symposium at Augusta, November 1982. (Abstract)
23. Sherman R, Sherman C, Parker L: Chronic phantom and stump pain among American veterans: Results of a survey. Pain 18:83 - 95, 1984.
24. Sherman R: Direct evidence of a link between burning phantom limb pain and stump blood circulation. Orthopedics 7:1319 -1320, 1984.
25. Sherman, R. Relationships between strength of low back muscle contractions and reported intensity of low back pain. Pain 18: 374, 1984. (Abstract)
26. Richards S, Sherman R: Paraspinal EMG levels following spinal cord injury. Proceedings of the fifth annual meeting of the Society of Behavioral Medicine held in Philadelphia, 1984. (Abstract)
27. Sherman R, Sherman C: A comparison of phantom sensations among amputees whose amputations were of civilian and military origins. Pain 21:91 - 97, 1985.
28. Sherman R, Barja R: Surface electromyographic evaluation of chronic low back pain vs. reported intensity of pain. Proceedings of the Society of Orthopedic Surgery. Annual meeting in Denver, 1983. (Abstract)
29. Sherman R: Relationships between jaw pain and jaw muscle contraction level: Underlying factors and treatment effectiveness. J. Prosthetic Dent. 54: 114 – 118, 1985.
30. Sherman R: Relationships between strength of low back muscle contraction and intensity of chronic low back pain. Am. J. Phys. Med. 64:190 – 200, 1985.
31. Sherman R, Ernst J, Markowski J: Phantom body pain and near surface blood flow among spinal cord injured veterans. Proceedings of the American Paraplegia Society. Annual meeting in Las Vegas Sept. 1985. (Abstract)

32. Barja R, Sherman R: What to expect when you lose a limb: A guide for patients expecting or having just had an amputation. US Government Printing Office stock number 008-020-01083-9, 1985. (Book)
33. Hanson B, Sherman R, Ficarra A: Masseter muscle silent period in patients with internal derangement of the temporomandibular joint before and after splint therapy. J. of Prosthetic Dentistry 54(6): 846 - 850.
34. Sherman R, Ernst J, Markowski J: Relationships between near surface blood flow and altered sensations among spinal cord injured veterans. American J. of Physical Medicine, 65: 281 - 297, 1986.
35. Sherman, R., Ernst, J., Barja, R., and Bruno, G., Application of recent discoveries of physiological bases for phantom limb and phantom body pain to chronic pain mechanisms and treatments. Med. Bull. Europe, 43: 14 - 19, 1986.
36. Sherman R, Sherman C, Bruno G: Psychological factors influencing chronic phantom limb pain: An analysis of the literature. Pain, 28: 285 - 295, 1987.
37. Jennings B, Sherman R: Anxiety, locus of control, and satisfaction in patients undergoing ambulatory surgery. Military Medicine, 152: 206-208, 1987.
38. Sherman R, Barja R, Bruno G: Thermographic correlates of chronic pain: Archives of Physical Medicine and Rehabilitation, 68: 273-279, 1986.
39. Sherman R, Bruno G: Concurrent variation of burning phantom limb and stump pain with near surface blood flow in the stump. Orthopedics, 10: 1395-1402, 1987.
40. Sherman R, Ernst J, Markowski J: Differences between upper trunk heat patterns in complete and incomplete spinal cord injured veterans. Paraplegia, 25: 466 - 474, 1987.
41. Sherman R, Ernst J, Barja R, Bruno G: Phantom pain: A lesson in the necessity for carrying out careful clinical research in chronic pain problems. Rehabilitation Research and Development, 25(2): vii - x, 1988. (Editorial)
42. Arena J, Sherman R, Bruno G, Smith J: The relationship between situational stress and phantom limb pain: Preliminary analysis. Biofeedback and Self-Regulation, 13(1): 55, 1988. (Abstract)
43. Bruno G, Sherman R, Arena J, Schwartz J: Differential effectiveness of EMG feedback in combination with home use of relaxation exercises for treatment of MPD and mixed MPD/IJD: Results of a blind diagnostic study of jaw area pain. Biofeedback and Self-Regulation, 13(1): 59, 1988 (Abstract)
44. Sherman R, Arena, JG, Bruno GM, Smith JD: Precursor relationships between stress, physical activity, meteorological factors, and phantom limb pain: Results of six months of pain logs. Proceedings of the Joint meeting of the Canadian and American Pain Societies, Toronto Canada, November, 1988 (Abstract).
45. Sherman R, Arena JG, Searle J, Sherman CJ: Relationships between low back pain, stress, and continuous recordings of paraspinal surface EMG and movement in patients' normal environments. Proceedings of the Joint meeting of the Canadian and American Pain Societies, Toronto Canada, November, 1988 (Abstract).
46. Arena J, Sherman R, Bruno G, Young T: Reliability of paraspinal electromyographic

- recordings in low back pain and non-pain subjects. Presented at the annual meeting of the American Psychological Association, 1988. (abstract.)
47. Sherman R, Arena J, Bruno G, Young T: Electromyographic recordings of low back pain subjects in different positions vs. results of standard diagnosis. Presented at the annual meeting of the Am. Psych. Assoc., 1988. (Abstract)
48. Sherman R, Barja R: Treatment of post-amputation and phantom limb pain. In (K. Foley and R. Payne, eds.) Current therapy of pain. B. C. Decker, Publisher, Ontario, 1989. (Chapter)
49. Arena J, Sherman R, Bruno G & Young, T: Electromyographic recordings of five types of low back pain subjects and non-pain controls in different positions. Pain 37: 57-65, 1989.
50. Sherman, R.: Phantom limb and stump pain. Chapter in (R. Portenoy, ed.) Neurologic Clinics of North America 7(2): 249-264, W.B. Saunders Co., Publisher. 1989. (Chapter)
51. Arena J, Sherman R, Bruno G: Professionals' and low back pain patients' expectations of differences in response patterns on the MMPI as a function of presence or absence of chronic pain. Biofeedback and Self-Regulation, 14(2): 127, 1989 (Abstract)
52. Arena J, Sherman, R, Bruno G: Electromyographic recordings of low back pain subjects in different positions during low and high pain levels. Biofeedback and Self-Regulation, 14(2): 129, 1989 (Abstract)
53. Sherman R, Sherman C: Relationships between continuous environmental recordings of posterior trunk muscle tension and patterns of low back pain and tension headaches. Biofeedback and Self-Regulation, 14(2): 168, 1989 (Abstract)
54. Sherman R, Sherman C, Grana A: Occurrence of acute muscle contractions in the residual limbs of amputees preceding acute episodes of phantom limb pain. Biofeedback and Self-Regulation, 14(2), 169, 1989. (Abstract)
55. Arena J, Sherman R, Bruno G: The relationship between humidity level, temperature, and phantom limb pain: Preliminary Analysis. Biofeedback and Self-Regulation, 14(2): 128, 1989. (Abstract)
56. Sherman R, Arena J, Bruno G, Young T: A comparison of surface EMG and thermographic evaluations of five diagnostic categories of low back pain subjects. Proceedings of the American Pain Society's 1989 annual meeting, page 24. Phoenix Arizona, October 1989. (Abstract)
57. Searle J, Arena J, Sherman R: A Portable activity monitor for musculoskeletal pain disorders. Proceedings of the IEEE Engineering in Medicine Society's 11th annual international conference, 1989. (Abstract)
58. Sherman R, Arena J, Ernst J: The mystery of phantom pain: Growing evidence for physiological mechanisms. Biofeedback and Self-Regulation, 14(4): 267-280, 1989.
59. Arena J, Sherman R, Bruno, GM, Smith J: The relationships between situational stress and phantom limb pain: Cross-lagged correlational data from six month pain logs. Psychosomatic Research. 34: 71-77, 1990.
60. Sherman R: Ambulatory recording methodology. Proceedings of the 21st annual meeting of the Association for Applied Psychophysiology. Washington DC, 1990. (Abstract)
61. Sherman R: Mechanisms of phantom pain: new findings. Proceedings of the 21st annual

meeting of the Association for Applied Psychophysiology. Washington DC, 1990. (Abstract)

62. Arena J, Sherman R, Bruno G, Young T: Temporal stability of paraspinal electromyographic recordings in low back pain and non-pain subjects. Int Journal of Psychophysiology, 9: 32-37, 1990.

63. Sherman R, Karstetter K: Relationships between RSD related pain and patterns of near surface blood flow: Stability of (1) concurrent changes due to treatment and over time and (2) relative locations of pain and of blood flow asymmetries. Proceedings of the 1990 annual meeting of the American Pain Society, 1990. p. 24 (Abstract)

64. Arena J, Bruno M, Young T, Sherman R, Cocilovo A: Videothermographic evaluations of four types of chronic low back pain subjects in low and high pain states. Proceedings of the 1990 annual meeting of the American Pain Society, 1990. p. 24 (Abstract)

65. Sherman R, Arena J, Searle J, Ginther J: Development of an ambulatory recorder for evaluation of muscle tension related low back pain and fatigue in soldiers' normal environments. Military Medicine, 156: 245 - 248, 1991.

66. Arena J, Sherman R, Bruno G, Young T: Electromyographic recordings of low back pain subjects and non-pain controls in six different positions: Effect of different pain levels. Pain, 45: 23 - 28, 1991.

67. Karstetter K, Sherman R: Use of Thermography for initial detection of early Reflex Sympathetic Dystrophy. Journal of the American Podiatric Medical Association, 81: 198 - 205, 1991.

68. Sherman R, Sherman C: Physiological parameters that change when pain changes: Approaches to unraveling the "cause-or-reaction" quandary. Bulletin of the American Pain Society, 1(4): 11 - 15, 1991.

69. Sherman R, Hemler D, Varnado S: Pain and the problem causing it aren't always in the same place. FAMC Pamphlet 40-60, 1991. (booklet)

70. Sherman R, Arena J, Griffin V, Bruno G, Cocilovo A: Biofeedback for the treatment of phantom limb pain: An update. California Biofeedback, 7(3): 7 - 8 1991.

71. Sherman R, Varnado S, Caminer S, Arena J: Changes in paraspinal muscle tension as predictors of changes in low back pain. Proceedings of the 1991 annual meeting of the American Pain Society p. 64, 1991. (Abstract)

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REVIEWS OF MY WORK IN SCIENTIFIC PUBLICATIONS

1. Holly M: Only the limb is phantom: The pain is real. *Aches and Pains* 3(6): 20 - 25, 1982.
2. Cirillo A: Interview with Dr. Richard Sherman. *Orthopedics Today*, March Issue, 1984.
3. Glaros A: Frontiers in Instrumentation: An interview with Richard Sherman. *Biofeedback* 18 (1): 14 - 15, 1990.
4. Landers S: Pain in "Phantom Limbs" eased with biofeedback. *APA Monitor* 21(7): 29, 1990.
5. Glaros A: Interview with Richard Sherman. *Biofeedback* 19(2):22-26, 1991.
6. Kilgore S: Biofeedback for pain: A Multipractioner approach. *Biofeedback*, 1994.
7. NIH funds study on efficacy of biofeedback for pain. *APA Monitor*, 1994.
8. Peckel L: Biofeedback study for low back pain wins grant from new NIH office. *Spine Letter*, 1 (1): 6 - 8, March 1994.
9. Brief review of my work on treatment of headaches with pulsing magnetic fields - Clinical Briefs section, *US Medicine* 32(11):18, June 1996.
10. Brief review of my work on treatment of headaches with pulsing magnetic fields - Bulletin Board section, *Federal Practitioner*, page 65, July 1996.
11. Review of our work on incontinence among female soldiers - *Persist* newsletter 1(2): 1, 1998.

PUBLIC MEDIA COVERAGE OF MY RESEARCH

(Unless otherwise specified, entire story based on work at my laboratories.)

1. Phantom pain - National wire service from Augusta Chronicle, 17 April 1981. Parts of story run by numerous papers including the New York Times.
2. Phantom pain - Augusta Herald, 8 January 1982.
3. Low back pain - Augusta Chronicle, 9 Feb. 1983.
4. Phantom pain - ABC News, June 1984.
5. Amputees and phantom pain - CNN National News five minute review spot multiple times between 15 and 20 March 1983.
6. Phantom pain - PART of lead article on chronic pain in Time, June 1984.
7. Chronic pain - HSC Mercury, 1985.
8. Blood flow and chronic pain among the spinal cord injured - Augusta Chronicle, February 1985.
9. Physiological basis for pain among the spinal cord injured - CNN National Television News spot run multiple times during March 1985.
10. Investigations of pain - National wire service from Rocky Mountain News, October 1987.
11. Two part series on pain research - ABC News, December 1987.
12. Pain evaluation laboratory - Colorado Public TV, June, 1988.
13. Phantom pain mechanisms and treatment - Denver Post, July 1989.
14. Biofeedback for pain - Self Magazine, May 1994 (Included brief review of some of my work).
15. Biofeedback - Thought control: Can biofeedback improve your mental and physical performance? - men's Fitness, March 1995 (Included several paragraphs about my work and comments on the field).
16. Pulsing electromagnetic fields for migraine headaches - Bone treatment may relieve migraine pain - The Mercury (National Army newspaper), May, 1996.
17. Alternative Medicine short subject - NBC national evening news, June, 1996 (Included about one minute of views showing my work on treatment of headaches with pulsing magnetic fields).
18. Alternative Medicine - Several paragraphs in a story on alternative medicine - Cosmopolitan magazine, Nov 1996.
19. Phantom pain - About half of a three page article on phantom pain - Chronic Pain Letter XIV (1), January, 1997.
20. Use of Pulsing Electromagnetic Fields in the treatment of migraine headaches - about four minutes on NBC local evening news, November, 1997.
21. Controlled study of Pulsing Electromagnetic Fields for migraines - about three minutes of ABC local news, August, 1999.
22. Phantom Pain Sees the Light of Day - two page article quoting me and discussing my work with phantom pain and amputees. Written by Wendy Meyeroff; Appeared in half the planet.com on 19 June, 2000.

Community Activities

President, Lakepointe Home Owners' Association, Lacey, WA, 1994 – 1998.

Co-chair of Human Use Committee and Chair of Animal Use Committee at Madigan Army
Medical Center 1994 – 1998

Red Cross Volunteer at Madigan Army Medical Center 1998 – 2004

Board Member, Olympic Havurah, 2004 – present.