

Kim L Coleman

CONTACT:

Orthocare Innovations

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EDUCATION:

University of California at Davis

Master of Science in Biomechanics, 1992

Davis, CA

University of Texas at Austin

Bachelor of Arts in Exercise Physiology/Organic Chemistry, 1986

Austin, TX

PROFESSIONAL EXPERIENCE:

2007 - present

Orthocare Innovations

Co-Founder; Director of Clinical Research

Mountlake Terrace, WA

Activities include: facilitation and oversight of OCI clinical research; global support of basic research and pharmaceutical trials utilizing StepWatch technology; participation in design, development and testing of innovative technologies in the prosthetics and elder care arenas.

2005 – present

Cyma Corporation

President

Mountlake Terrace, WA

Company activities through 9/07: sales, support, and development of the StepWatch Activity Monitor system (SAM3); collaborative research involving physical activity monitoring; NIH SBIR supported development of technology to assist with lower limb prosthetic alignment and various elder care applications. IP transferred to Orthocare Innovations 10/07.

2000 - 2005

Director of Research; Principal Investigator

Seattle, WA

Awarded and successfully completed NIH SBIR Phase 1 and 2 grants: An Easy-to-Use System for Ambulatory Activity Evaluation. Work focused on hardware and firmware design for robust, highly accurate StepWatch3 (SAM3) instrumentation with attention to cost and manufacturability; development of an intuitive software interface; development of powerful, easy to use analysis tools, demonstration projects in target markets, collection of normative data.

1994 - 2002

Prosthetics Research Study

Research Engineer

Seattle, WA

Projects included: development, manufacture, distribution and technical support of the StepWatch2 activity monitor for functional assessment; software development for analysis and presentation of gait data; research on the effects of prosthetic component materials on amputee gait; clinical outcomes studies to evaluate prosthetic component influence on patient satisfaction and gait function; kinematic data collection for FEA modeling toward the design of improved prosthetic components; development of educational CD-ROMs for prosthetics, amputation surgery, and rehabilitation.

1989 - 1992

University of California at Davis

Research Assistant in Biomechanics

Davis, CA

Investigated the mechanics of distance running, specifically focusing on efficiency, adaptation to anthropometric and environmental factors, loading, and susceptibility to over-use injuries. Duties also included research, design and testing of commercial athletic shoes (running and golf).

Teaching Assistant in Exercise Sciences and Biomedical Engineering

Assisted and taught undergraduate courses in biomechanics, neuromuscular control of movement, methods of conditioning, and graduate courses in research techniques in biomedical engineering.

1987

The Hills Medical Sports Complex

Supervisor of Physiological Testing

Austin, TX

Supervised program for assessing cardiovascular fitness, physical strength and flexibility, body composition, and profiling blood chemistry. Developed and implemented a fitness program for disabled children and a recreational volleyball program for adults. Advised on strength/fitness programs for adults.

1985-1986 **Bio-Organic Chemistry Laboratory** Austin, TX
Research Assistant

Projects focused on development of anti-viral agents via biomimetic manipulation of nucleotide sugar base structures. Technologies/techniques: NMR, UV and mass spectroscopy, chromatographies.

1986 **Kinesiology/Biochemistry Laboratory** Austin, TX
Research Assistant

Studied effects of exercise and aging on biochemical and cellular processes of synaptosomal mitochondria in the brain utilizing animal models. Technologies/techniques: enzyme assays, photospectroscopy, development of techniques for tissue preparation/separation.

1984-1986 **Women's Athletics Department Medical Training Facility** Austin, TX
Intern

Advised coaches in planning practice and training regimens; routinely assessed body composition of athletes; created an educational athlete's training log; established computerized record keeping system for medical training facility.

PROFESSIONAL ACTIVITIES:

Vice Chair of Gait Society, American Academy of Orthotists and Prosthetists (2008-present).

Board member: Cyma Corporation (2000 – present)

Peer-review: Journal of Rehabilitation Research and Development
 Journal of Prosthetics and Orthotics
 Journal of Internal Medicine
 Archives of Physical Medicine and Rehabilitation

Symposium Organizer: "Approaches to Outcomes Assessment in P&O." World Congress of the International Society for Prosthetics and Orthotics, 2004.

Board of Advisors: *Viva!: Using Best Practices to Promote Successful Aging*. The Erickson Foundation (2004 - present)

USA Volleyball Sports Medicine and Performance Commission Resource Advisory Team: Biomechanics Team Member, Olympic Training Center, Colorado Springs, CO (1995-1998)

HONORS:

Departmental Graduate Fellowship at UC Davis (1989)
 Highest honors upon graduation from the University of Texas (1986)
 Member of Phi Beta Kappa honor society
 Outstanding Scholar-Athlete Scholarship at UT Austin (1982, 1983)
 Full Athletic Scholarship for Volleyball, UT Austin (1982-1986)

ACTIVITIES:

Volunteer Volleyball Coach, Meadowbrook Community Center (2003 – 2005)
 James E. Coleman Memorial Scholarship Committee, Aurora University (2002 – Present)
 Metalworking Artist (artfolia.com), (1999 - present)
 Volunteer Volleyball Coach, Nathan Hale High School, Seattle, WA (1998)
 Wilderness Ranger for US Forest Service, Grand Marais, Minnesota (1992)
 Stained Glass Artist, Brugge, Belgium (1987, 1989)
 Instructor for Youth/ Adult Volleyball Clinics (1982-1984)
 Wilderness Canoe Guide, Voyageur Trails, Ely, Minnesota

LANGUAGES:

Spanish, Dutch, French

PEER-REVIEWED PUBLICATIONS

Cavanaugh JT, Coleman KL, Gaines JM, Laing L, Morey MC. Using step activity monitoring to characterize ambulatory activity in community-dwelling older adults. *JAGS* 2007;55(1):120-124.

Boone DA, Coleman KL. Use of a Step activity monitor in determining outcomes, *J Prosth Orth*, 18(15):86-92, 2006.

Boone DA, Coleman KL. Use of the Prosthesis Evaluation Questionnaire. *J Prosth Orth*, 18(15):68-79, 2006.

Song KM, Bjornson KF, Capello T, Coleman K. Use of the StepWatch Activity Monitor for characterization of normal activity levels of children, *J Ped Orth*, Mar-Apr;26(2):245-9, 2006.

Haeuber E, Shaughnessy M, Forrester LW, Coleman KL, Macko RF. Accelerometer monitoring of home and community-based ambulatory activity after stroke. *Arch Phys Med Rehabil.* Dec;85(12):1997-2001, 2004.

Coleman KL, Boone DA, Laing LS, Mathews DE, Smith DG. Quantification of Prosthetic Outcomes: Elastomeric Gel Liner with Locking Pin Suspension versus Polyethylene Foam Liner with Neoprene Sleeve Suspension. *J Rehabil Res Dev*, Jul;41(4):591-602, 2004.

Smith DG, Domholdt E, Coleman KL, Del Aguila ML, Boone DA. Ambulatory Activity in Men with Diabetes: Relationship Between Self-Reported and Real-World Performance-Based Measures. *J Rehabil Res Dev*, Jul;41(4):571-80, 2004 .

Macko MF, Haeuber E, Shaughnessy M, Coleman KL, Boone DA, Smith GV, Silver KH. Microprocessor-Based Ambulatory Activity Monitoring in Stroke Patients, *Med Sci Sp Exerc*, Vol. 34, No. 3, pp. 394-399, 2002.

Coleman KL, Boone DA, Smith DG, Czerniecki JM. Effect of Transtibial Prosthesis Pylon Flexibility on Ground Reaction Forces during Gait, *Int Prosthet Orthot*, 25: 195-201, 2001.

Bjornson KF, Song K, Coleman K, Boone D. (2000) Application of the Step Activity Monitor (SAM) to Define Normal Levels in Children. *Developmental Medicine and Child Neurology* 42(83):23, 2000.

McDuffee LA, Stover SM, Coleman K. Limb Loading Activity of Adult Horses Confined to Box Stalls in an Equine Hospital Barn, *Am J Vet Res*, 61(3):234-237, 2000.

Coleman KL, Smith DG, Boone DA, Joseph AW, del Aguila MA. Step Activity Monitor: Long-Term Continuous Recording of Ambulatory Function. *J Rehabil Res Dev*, 36(1):8-18, 1999.

McDonald CM, Walsh DD, Widman L, Walsh SA, Coleman K: Use of the Step Activity Monitor for Continuous Objective Three-Day Physical Activity Monitoring in Children, *Dev Med Child Neuro*, Vol 80 Suppl., 36, 1999.

Widman L, Walsh DD, Walsh SA, Coleman K, McDonald CM: Use of the Step Activity Monitor for Continuous Objective Physical Activity Assessment in Children with Duchene Muscular Dystrophy, *Dev Med Child Neuro*, Vol 80 Suppl., 20, 1999.

ABSTRACTS and PROCEEDINGS

Cavanaugh JT, Coleman KL, Gaines J, Morey M. Variability of stepping activity and number of activity bouts distinguish healthy older from younger adults, *Med Sci Sport Exerc*, 2005.

Coleman, K. Development and use of the Prosthesis Evaluation Questionnaire, *Proceedings of the International Society for Prosthetics & Orthotics 11th World Congress*, Hong Kong, 11, 1-6 Aug 2004.

Coleman, K. Approaches to outcomes assessment in prosthetics and orthotics: a dialog on methodology, effectiveness, and accessing "windows" to impact on life, *Proceedings of the International Society for Prosthetics & Orthotics 11th World Congress*, Hong Kong, 75-76, 1-6 Aug 2004.

Coleman, K. The StepWatch Activity Monitor: a tool for quantitative assessment of function, progress and outcomes in prosthetics and orthotics, *Proceedings of the International Society for Prosthetics & Orthotics 11th World Congress*, Hong Kong, 132, 1-6 Aug 2004.

Coleman, K. StepWatch Activity Monitor [Presented as: Coleman K, Beck J, Laing L, Boone D, Macomber B, Austin R. Step Activity Monitor: a tool for research and clinical measurement of ambulatory activity (poster)] *6th Annual NIH SBIR/STTR Conference*, Baltimore, MD, 22-23, June 23-24, 2004.

Coleman K. A step in time: objective measurements that quantify outcome and justify prescription. *Proceedings of the Second International Conference of Advanced Prosthetics*, Newport Beach, CA USA, April 18-20, 2002.

Coleman K, Boone D, Smith DG, Laing L, Mathews D, Czernecki J. Cross-over trial comparing Alpha and Pelite Liners. *Proceedings of the 28th AAOP Annual Meeting and Scientific Symposium*, Orlando, FL USA, March 20-23, 2002.

McDonald, CM, Walsh SA, Widman L, Walsh D, Coleman K, Abresch TR. Quantitative assessment of physical activity in able-bodied children with the step activity monitor (SAM). In: Abstracts of the 6th Annual Meeting of the Gait and Clinical Movement Analysis Society. *Gait and Posture* 13: 288-289, 2001.

McDonald, CM, Walsh SA, Widman L, Walsh D, Coleman K, Abresch TR. Energy expenditure during ambulation and quantitative daily activity levels in non-obese and obese school age children. In: Abstracts of the 6th Annual Meeting of the Gait and Clinical Movement Analysis Society. *Gait and Posture* 13: 290, 2001.

Coleman K, Boone D, Smith DG, Laing L, Mathews D. Relative influence of changing the prosthetic foot vs. the socket suspension system on ambulatory activity and patient satisfaction, *Proceedings of the 10th World Congress of the International Society for Prosthetics and Orthotics*. Glasgow, Scotland, TO6-2, July 2-6 2001.

Coleman K, Boone D, Smith DG, Laing L, Mathews D, Czernecki J. Crossover trial comparing Alpha liner with pelite liner for trans-tibial prostheses using ambulatory activity and questionnaire responses, *Proceedings of the 10th World Congress of the International Society for Prosthetics and Orthotics*. Glasgow, Scotland, WO5-5, July 2-6 2001.

Coleman K, Boone D, Smith DG, Laing L. Progress following elective trans-tibial amputation: one year of continuous ambulatory monitoring. A Case Study., *Proceedings of the 10th World Congress of the International Society for Prosthetics and Orthotics*. Glasgow, Scotland, ThO11-5, July 2-8 2001.

Laing L, Coleman K, Boone D, Smith DG. What is important for prosthesis satisfaction? *Proceedings of the 10th World Congress of the International Society for Prosthetics and Orthotics*. Glasgow, Scotland, THP2.2, July 2-8 2001.

Coleman K, Boone D, Smith DG, Laing L. Distinctive differences in duration and rate profile of ambulation between populations with transtibial amputation with diabetes, and without impairment, *Proceedings of the 10th World Congress of the International Society for Prosthetics and Orthotics*. Glasgow, Scotland, TH011.2, July 2-6 2001.

McDonald CM, Widman L, Walsh D, Walsh SA, Coleman K, Abresch, RT: Use of the Step Activity Monitor for continuous objective physical activity assessment in children with obesity, *Proceedings of the American Academy of Cerebral Palsy and Developmental Medicine*, Toronto, Canada, September 2000.

Macko RF, Heuber E, Shaughnessy M, Boone DA, Coleman KL, Smith GV, Silver KHC, Gardner AW. Portable Ambulatory and Activity Monitoring in Hemiparetic Stroke Patients, *Proceedings of the Second National Department of Veterans Affairs Rehabilitation Research and Development Conference Proceedings*, Arlington, VA USA, 208, February 20-22, 2000.

Coleman KL, Boone DA, Laing LS, Mathews DE, Czernecki JM, Sangeorzan BJ. Quantification of Prosthetic Treatment Outcomes - Elastomeric Liner & Locking Pin Suspension vs Pelite Liner & Neoprene Sleeve Suspension, *Proceedings of the Second National Department of Veterans Affairs Rehabilitation Research and Development Conference Proceedings*, Arlington, VA USA, 100, February 20-22, 2000.

Boone DA, Laing LS, Coleman KL, Burgess EM, Smith DG, Mathews DE. Multimedia Amputee Rehabilitation Team Training, *Proceedings 1st National Meeting Rehabilitation Research and Development Service*, Washington, D.C. USA, 53, October 1-3, 1998.

Coleman KL, Boone DA, Smith DG. Step Activity Monitor: A Tool for Functional Evaluation and Assessment of Rehabilitation Outcome, *Proceedings 1st National Meeting Rehabilitation Research and Development Service*, Washington, D.C. USA, 54, October 1-3, 1998.

Coleman KL, Boone DA, Smith DG, Mathews DE, Laing LS. Quantification of Prosthetic Outcome: FlexWalk-II Foot vs. SACH Foot, *Proceedings of the 1st National Meeting Rehabilitation Research and Development Service*, Washington, D.C. USA, 197, October 1-3, 1998.

Boone DA, Urban ND, Smith DG, Burgess EM, Mathews DE, Coleman KL. Use of CAD/CAM for Prosthetic Services in the Developing World. In: Soede M, Verbout AJ, Swart M, eds. *IXth World Congress of the International Society for Prosthetics and Orthotics*, Amsterdam, The Netherlands, 74-76, June 28-July 3, 1998.

Smith DG, Coleman KL, Boone DA. Improved Activity Following Elective Trans-Tibial Amputation for Pain: Outcome Assessment by Long-Term Activity Monitoring (A Case Report), In: Soede M, Verbout AJ, Swart M, eds. *IXth World Congress of the International Society for Prosthetics and Orthotics*, Amsterdam, The Netherlands, 728-730, June 28-July 3, 1998.

Coleman KL, Boone DA, Smith DG, Mathews DE, Laing LS. Functional Outcome Assessment Using Objective Measures of Patient Satisfaction and Gait Activity: A Comparison of 2 Feet, In: Soede M, Verbout AJ, Swart M, eds. *IXth World Congress of the International Society for Prosthetics and Orthotics*, Amsterdam, The Netherlands, 690-692, June 28-July 3, 1998.

Laing LS, Coleman KL, Smith DG, Boone DA, Legro MW. Quantifying Multi-Dimensional Perspectives on a Change in Prosthetic Feet: A Use of the Prosthesis Evaluation Questionnaire, In: Soede M, Verbout AJ, Swart M, eds. *IXth World Congress of the International Society for Prosthetics and Orthotics*, Amsterdam, The Netherlands, 732-734, June 28-July 3, 1998.

Coleman KL, del Aguila MA, Boone DA, Smith DG. Self-Selected Walking Velocity as a Measure of Function: Relationship to Real World Ambulatory Activity of Diabetics, In: Soede M, Verbout AJ, Swart M, eds. *IXth World Congress of the International Society for Prosthetics and Orthotics*, Amsterdam, The Netherlands, 371-373, June 28-July 3, 1998.

Smith DG, Coleman KL, del Aguila MA, Boone DA. Functional Ambulation of Geriatric Male Diabetics: Correlation of Step Count Based Gait Assessment with the SF-36, *Proceedings of the 65th Annual Meeting of the American Academy of Orthopaedic Surgeons*, New Orleans, LA USA, March 19-23, 1998.

Coleman K. Gait analysis in rehabilitation medicine [position statement] In: Quatrano LA, Stanhope SJ, eds. *Gait Analysis and Rehabilitation Medicine*. Arlington, VA, National Center for Medical Rehabilitation Research, U.S. Department of Health and Human Services, A14-A16, September 26-28, 1996, 1998.

Coleman KL, Emery H. Evaluation of Clinical Interventions Using Functional Movement Analysis and Disability Measures [Participant's Recommendation] In: Quatrano LA, Stanhope SJ, eds. *Gait Analysis in Rehabilitation Medicine*. Arlington, VA, National Center for Medical Rehabilitation Research, U.S. Department of Health and Human Services, B-6, September 26-28, 1996, 1998.

Smith DG, Boone DA, Coleman K, Legro M. Outcome Assessment in Prosthetics and Orthotics, In: Berke GM, Langdon SD, eds. *Proceedings of the 23rd AAOP Annual Meeting & Scientific Symposium*, San Francisco, CA USA, 27-30, March 12-15, 1997.

Coleman KL, Smith DG, Joseph AW, Boone DA. Gait Activity Monitor for Long-term Measurement of Ambulatory Function, *RESNA '95, 18th Annual Conference*, Vancouver BC, Canada, 168-179, June 9-14, 1995.

Borchers RE, Coleman KL, Czerniecki J, Boone D, Gitter A. The Effects of Shank Stiffness on the Loading of Prosthetic Components, *Proceedings of the International Society for Prosthetics and Orthotics 8th World Congress*, Melbourne, Australia, 41, April 3-7, 1995.

Coleman KL, Smith DG, Joseph AW, Borchers RE, Boone DA, Macomber G. Gait Activity Monitor: A Device for Objectively Evaluating the Functional Outcome of Prosthetic, Orthotic or Medical Treatment, *Proceedings of the International Society for Prosthetics and Orthotics 8th World Congress*, Melbourne, Australia, 74, April 3-7, 1995.

BOOK CHAPTERS

Coleman JE. & Coleman KL. Biomechanics: Analyzing Skills and Performance, In C. McGown (Ed.), Science of Coaching Volleyball (pp. 47-80). Champaign, IL: Human Kinetics Publishers, 1994.

CD-ROMS

Boone DA, Coleman KL, Laing LS. StepWatch Software 3.1, Cyma Corporation, Seattle WA, USA, 2004.

Boone DA, Coleman KL, Laing LS, Beck JC. StepWatch Software 2.0, Cyma Corporation, Seattle, WA USA, 2002.

Boone DA, Coleman K, Beck JC. StepWatch Software 1.8, Cyma Corporation in cooperation with Prosthetics Research Study: Seattle, WA USA, 2001.

Boone DA, Laing LS, Coleman KC, Mathews DE, Burgess EM. Management of Lower Extremity Amputations CD-ROM [Contains original text: Burgess EM, Romano RL Zettl JH. The Management of Lower Extremity Amputations, Veterans Administration, 1969], Prosthetics Research Study, Seattle, WA USA, 1998.

Boone DA, Coleman KL, Mathews DE. Visual Interactive Prosthetics: VIP [CD-ROM], Prosthetics Research Study (Distributor and Producer), Seattle, WA USA, 1995.

REPORTS

White M, Jacobson D, Boone D, Beck J, Coleman K. Development of a Proof-of-concept Design for a Lower Extremity Advanced Prosthesis (LEAP) [unpublished report submitted to National Institutes of Health]: SPARTA, Inc. San Diego, CA and Prosthetics Research Study Seattle, WA, June 23, 1997.

SELECTED LECTURES and SCIENTIFIC EXHIBITS

"Measurement and Analysis of Long-term Ambulatory Activity in Persons with Physical Disability: Research and Clinical Examples." State of the Science Conference on Exercise and Recreational Technologies for People with Disabilities. Denver, CO, May 30, 2006.

"StepWatch Activity Monitor. Measurement and Analysis of Long-term Ambulatory Activity in Persons with Physical Disability: Operation and Analysis Methods." State of the Science Conference on Exercise and Recreational Technologies for People with Disabilities. Denver, CO, May 31, 2006.

"StepWatch Activity Monitor: A Tool for Quantitative Assessment of Long-Term Ambulatory Activity." *Outcome Measurement in Rehabilitation*. NICHD, NCMRR. Bethesda, MD, Dec. 9, 2005.

"StepWatch Activity Monitor: A Tool for Quantitative Assessment of Long-Term Ambulatory Activity." *Walking for Health: Measurement and Research Issues and Challenges*. Urbana-Champaign, IL, Oct. 14, 2005.

"StepWatch Activity Monitor: A Tool for Quantitative Assessment of Long-Term Ambulatory Activity." *III Step Summer Institute on Translating Evidence into Practice: Linking Movement Science and Intervention*. Salt Lake City, UT, July 19, 2005.

"Long-term Measurement of Physical Function: Implications for Rehabilitation Prescriptions and Costs." RehabTECH, Monash University, Melbourne Australia, August 21, 2003.

"Prosthetics Research Study: Improving Function for the Amputee, Saving the Limb at Risk" [Scientific Exhibit/Booth]. Laing L, Coleman KL, Beck JC, Smith DG. *Tenth World Congress of the International Society for Prosthetics and Orthotics*, Glasgow, Scotland, July 2-6 2001.

"Mission and Current Projects at Prosthetics Research Study." Rotary International, Stanwood WA USA, May 19, 1999.

"Step Activity Monitor Instructional Course" University of Michigan and Michigan State University, Ann Arbor MI USA, October 1998.

"Prosthetics Research Study: Improving Function for the Amputee, Saving the Limb at Risk" [Scientific exhibit/booth] Laing L, Boone DA, Beck J, Coleman KL, Smith DG, Lipsky D. Ninth World Congress of the International Society for Prosthetics and Orthotics, Amsterdam, The Netherlands, June 28-July 3, 1998.

"Quantification of Prosthetic Treatment Outcomes: Comparison of SACH and FlexWalk II Feet" FlexFoot Corporate Headquarters, Laguna Hills, CA USA, May 6, 1998.

"Real World Functional Outcomes Evaluation. The Hong Kong Polytechnic University, Kowloon, Hong Kong, May 1998.

"Activity Monitoring in Outcomes Research. Joint Replacement Institute, Orthopaedic Hospital, Los Angeles, CA USA. February 4, 1998.

"Research and the Future at PRS" Northwest Chapter of AAOP, Portland, OR USA, October 5, 1997.

"Prosthetics Research Study: Improving Function for the Amputee, Saving the Limb at Risk" [Scientific Exhibit/Booth]. Laing L, Boone DA, Coleman K, Smith DG. *VIII World Congress of the International Society for Prosthetics and Orthotics*, Melbourne Australia, April 2-7, 1995.