

**David A. Dainty, Ph.D.**  
**Managing Scientist**

**Professional Profile**

Dr. David Dainty is a Managing Scientist in Exponent's Biomechanics practice. He has over a decade of expertise in injury biomechanics and human movement analysis. His analyses have included consulting in cases involving motor vehicle accidents; pedestrian impacts; slip, trip and falls; falls from height; boating accidents; sports injuries, and industrial accidents. Prior to becoming a consultant, Dr. Dainty was a professor and administrator at universities and colleges in both Canada and the United States. Dr. Dainty taught biomechanics and anatomy to both undergraduate and graduate students. His initial research endeavors were related to sports in terms of injury prevention and performance enhancement. He served as a biomechanics consultant to both the Canadian Figure Skating Association and the Canadian National Alpine Ski Team. Working with a colleague at the University of Ottawa, he investigated the chest deflection characteristics of anthropomorphic test devices (ATD's) as they relate to live human chest characteristics. Dr. Dainty moved to California and helped establish an impact laboratory at the University of California, San Diego, with a grant from the National Highway Traffic Safety Administration (NHTSA), performing full scale sled impacts with both ATD's and post mortem human subjects. After two years as a NHTSA grantee in California, he was recruited to be the Academic Dean of the Canadian Memorial Chiropractic College in Toronto where he remained for the next ten years. During this time he held adjunct appointments at both the University of Toronto and the University of Waterloo, teaching some biomechanics courses and continuing with research in ergonomics and product safety.

In 2000, Dr. Dainty returned to California as a biomechanics consultant. During his career, he has published a number of articles in the peer reviewed literature, co-authored a text book on Fundamentals of Biomechanics, published articles in public journals, and made several presentations both nationally and internationally. Dr. Dainty has served on review boards and was a member of both the American and Canadian Councils on Chiropractic Education setting standards and visiting colleges to ensure compliance. He is currently a member of the ASTM F13 Committee on walkway safety and holds certification as a tribometrist utilizing the English XLT tribometer. He is also a Certified Forensic Consultant through the American College of Forensic Examiners.

**Academic Credentials and Professional Honors**

Ph.D., Physical Education, Pennsylvania State University, 1979  
M.S., Exercise Physiology, University of Montana, 1971  
B.P.H.E., Physical and Health Education, University of Toronto, 1968

## **Current Licenses and Certifications**

American College of Forensic Examiners, Certified Forensic Consultant, 2005  
Certified XL Tribometrist, English Tribometer Course (ASTM STANDARD F1679), 2004,  
2007, 2010.

## **Languages**

French – Conversational

## **Publications**

Raymond DE, Landerville JB, Wheeler JB, Dainty DA. A parametric MADYMO analysis for determining seat belt usage in a frontal collision. Proceedings, International Society of Biomechanics XX Congress and the American Society of Biomechanics 29<sup>th</sup> Meeting, Cleveland, OH, August 2005.

Wheeler JB, Dainty DA, Brown DG. Cervical disc prolapse in rear-end automobile collisions: Injury mechanism unique to occupant and head restraint geometry. Proceedings, XVIIIth International Congress on Biomechanics, Zürich, Switzerland, July 8–13, 2001.

Dainty D, Mior S, Bereznick D. Validity and reliability of an isometric dynamometer as an evaluative tool in a rehabilitative clinic. *J Sports Chiropractic Rehabilitation* 1998; 12(3):109–117, Sept.

Nicholson R, Dainty D, Marcarian D. A quality assurance program for the clinical use of surface electromyography in the chiropractic office. *J Canadian Chiropractic Assoc* 1997, Jan.

Pierrynowski MR, Schroeder B, Garrity C, Dainty D, Bare J. Three dimensional sacroiliac motion during locomotion in asymptomatic male and female subjects. Proceedings, Biannual Conference of the Canadian Society for Biomechanics, Locomotion 6, August 1988.

Dainty D, Gagnon M, Lagasse P, Norman R, Robertson G, Springs E. Standardizing biomechanical testing in sport. Human Kinetics Publishers, Inc., Dainty D, Norman R, Champaign, IL, 1987.

Schneider DC, Nahum A, Dainty D, Awad J. Interaction of cadavers and the Hybrid III with a steering column assembly. Proceedings, Stapp Car Crash Conference, November, 1987.

Pittuck D, Dainty D. Swimming III: The effects of a modified ball on the mechanics of selected water polo skills in novice children. *International Series on Sport Sciences* 1979; 3:338–345.

Dainty D. The importance of impulse production in jumping. *The Professional Skater. The Circle* 1979; 2(10):7–8.

Kerr R, Booth M, Dainty D. Fit to dive. Canadian Amateur Diving Association, 1979.

Dainty D, Cotton C, Morrison W. An evaluation of selected figure skates. *The Circle* 1980; 2(15): 6–7.

Dainty D, Cotton C, Morrison W, Stidwell H. An evaluation of selected department store women's figure skates. A final report to the Canadian Figure Skating Association, November 1979. Summarized and Published in the *Canadian Skater* Spring 1980; 6–9.

Kerr R, Booth M, Dainty D, Gaboriault R, McGavern D. Talent identification for competitive diving. *The Psychological and Sociological Factors in Physical Performance*, Toronto, University of Toronto Press, 1980.

Kerr R, McGavern D, Booth M, Dainty D, Gaboriault R, O'Hara T. Motor skills analysis of the prerequisite abilities for diving. *Proceedings, 6<sup>th</sup> Commonwealth Conference, Sport, Physical Education, Recreation, Vol. II*, Edmonton, 1979.

Dainty D, Morrison W, Cotton C. The role of biomechanics in the evolution of sports equipment. *Coaching Science Update* 1980/81; 32–34.

Dainty D, McGill S, Mason M, Cotton C, Morrison W. An ergonomic investigation of window use capacities of physically handicapped adults. In: *Biomechanics VIII*, University Park Press, Volume A, pp. 553–560.

L'Abbe R, Dainty D, Newman J. An experimental analysis of thoracic deflection response to belt loading. *Proceedings, VIIth International Conference of the International Research Committee on Biokinetics of Impacts* pp. 184–194, 1982.

Dainty D, Cotton C. Thoracic response determination—Part II. A final Report to Biokinetics and Associates, August 1982.

McGill S, Dainty D. Computer analysis of energy transfers in children walking with crutches. *Proceedings, 2<sup>nd</sup> Biannual Conference of the Canadian Society for Biomechanics, Human Locomotion II*, pp. 18–19, September 1982.

McGill S, Dainty D. Computer analysis of energy transfers in children walking with crutches. *Archives of Physical Medicine and Rehabilitation* 1984; 65:115–120.

McGill S, Dainty D. Suggestions for modifications to children's crutches. *Physiotherapy Canada* 1984; 36(2):75–78.

Dainty D, Norman R. Load levels on the lower limb during jumping in figure skating. Final Report Presented to Canadian Figure Skating Association, June 1984.

L'Abbe R, Newman J, St. Laurent A, Dainty D, Smyth K. Development of a new ATD thorax. *Proceedings, IXth International Research Committee on Biokinetics of Impacts*, 1984.

## **Presentations**

Dainty DA, Kollias J, Nelson RC. A longitudinal investigation of the physiological and biomechanical characteristics of experienced runners. Presented at the 19th Annual Meeting of the American College of Sports Medicine, Philadelphia, PA, May 2, 1972.

Nelson RC, Gregor RJ, Dainty DA. Longitudinal effects of training on the biomechanics of running. Presented at the 1st International Interdisciplinary Symposium, Budapest, Hungary, April 18, 1973.

Dainty D, Booth M, Reardon F. An investigation of selected power variables in skilled athletes. Presented at the 10th Annual C.A.S.S. Conference, Winnipeg, September 29, 1977.

Morrison WE, Dainty DA. Case study: Physiological and performance profiles of two marathoners. Presented at the 2<sup>nd</sup> Annual Windsor - Guelph Symposium on Human Movement, Guelph, Ontario, November 18, 19, 1977.

Kerr R, McGavern D, Booth N, Dainty D, Gaboriault R, O'Hara T. Motor Skill analysis of the prerequisite abilities for diving. Presented at the Commonwealth Games Scientific Conference, Edmonton, Alberta, August, 1978.

Dainty DA. The analytical determination of tri-axial ground reaction forces. Presented at the 1977 Congress for the Canadian Society of Biomechanics, Toronto, Ontario, November 2–5, 1977.

Kerr R, Booth M, Dainty D, Gaboriault R, McGavern D. Talent identification for competitive diving. Presented at the 1978 Congress of C.S.P.L.S.P., Toronto, Ontario, November 2–5, 1978.

Dainty D. Biomechanics of figure skating. Presented at the Seminar for coaches of Elite Athletes, Ottawa, Ontario, May 1979.

Dainty D. Practical applications of testing procedures in figure skate evaluation. Presented at the Single/Pairs Seminar of the Canadian Figure Skating Association, London, Ontario, August, 1979.

Dainty D, Cotton C, Johnson B. Physical exertion of door opening. Presented at the Annual Meeting of CASS/ACSS, Vancouver, B.C., January 10–12, 1980.

Dainty D, Cotton C, Morrison W. Evaluation of selected figure skates. Presented at the Annual Meeting of CASS/ACSS, Vancouver, B.C., January 10–12, 1980.

Kerr R, Dainty D, Booth M. The components of diving ability. Presented at C.A.H.P.E.R. Convention, St. John's, Newfoundland, June 1980.

Cotton C, Dainty D, Morrison W. Anthropometric characteristics of female volleyball players. Presented at the 12th Annual C.A.S.S. Conference, Toronto, Ontario, October 1980.

Dainty D, Morrison W, Cotton C. Jumping characteristics of female volleyball players. Presented at the 12th Annual C.A.S.S. Conference, Toronto, Ontario, October 1980.

Dainty D, McGill S, Mason M, Cotton C, Morrison W. An ergonomic investigation of window-use capacities of physically handicapped adults. Presented at the VIIIth International Congress of Biomechanics, Nagoya, Japan, July 20–24, 1981.

L'Abbe R, Dainty D, Newman J. Thoracic response determination. Presented at VIIth International IRCOBI Conference, Koln, West Germany, September 1982.

McGill S, Dainty D. A computer analysis of energy transfers in children walking with crutches. Presented at the 2nd Biannual Conference of the Canadian Society for Biomechanics, Kingston, Ontario, September 1982.

Dainty D, Egan S, Gallup G. Kinematic characteristics of amateur boxing punches. Presented at the Annual Meeting of the Canadian Association of Sports Sciences, Victoria, B.C., October 1982.

Dainty D. Thoracic impact response. Presented to the Ministry of Transport, Ottawa, Ontario, September 1982.

Dainty D. Anthropomorphic test dummy characteristics under severe thoracic loading. Presented to the Department of Kinesiology, University of Waterloo, November 1984.

L'Abbe R, Newman J, St-Laurent A, Dainty D, Smyth JK. Development of new ATD thorax. Presented at the IXth IRCOBI Conference, September 4–6, 1984.

Dainty D. Thoracic impacts in automobile crashes. Presented at the University of Waterloo, Department of Kinesiology, April 1985.

Dainty D. Impact characteristics of dummies and cadavers in automobile crashes. Presented at Western American Association of Automotive Medicine Meeting, Los Angeles, CA, February 1986.

Dainty D. Injury mechanisms in automobile crashes. Presented at University of Toronto, Department of Physical Education, November 1986.

Dainty D, Gatterman M, Geis G, Mior S. An algorithm for competency determination in curriculum development. Presented at the Congress of Chiropractic Educators, Marietta, GA, March 1992.

McDiarmid F, Morrison K, Campbell P, Dainty D. The effects of daily use of a low-back cushion support on the frequency and intensity of chronic low-back pain episodes. Presented at the 1992 International Conference on Spinal Manipulation, Chicago, IL, May 1992.

Dainty D, Gatterman M, Geis G, Mior S. Curriculum development: The CMCC Experience. Presented at the Congress of Chiropractic Educators, Las Vegas, NV, February 1994.

Dainty D, Mior S, Bereznick D. Validity and reliability of an isometric dynamometer used as an evaluation tool in a rehabilitation clinic. Presented at the CORE Conference, San Diego, CA, June 1996.

Wheeler J, Dainty D. Forensic biomechanics. Presented to San Diego North County Trial Lawyers, Vista, CA, August 2001.

### **Prior Experience**

Senior Biomechanist, Vector Scientific, Inc., 2001–2010

Senior Biomechanist, Knott Laboratory, Inc., 2000–2001

Professor of Biomechanics (see below for academic appointments) 1975–2000

President and Consultant in Biomechanics and Ergonomics, Ergofit and Associates, 1996–2000

Consultant in Biomechanics, Bosaro Biotechnology, Inc., Toronto, Canada, 1995–1996

Chairman of Scientific Committee and Consultant to the Canadian Alpine Ski Team, 1986–1993

Biomechanics Consultant to Canadian Figure Skating Association, 1978–1983

Consultant in Biomechanics, Biokinetics and Associates, Ottawa, Canada, 1983

### **Academic Appointments**

Professor of Biomechanics, University of Toronto, Faculty of Physical Education and Health, 1998–2000

Visiting Professor in Biomechanics, Pepperdine University, Department of Sports Medicine, 1998

Adjunct Professor of Biomechanics, University of Waterloo, Department of Kinesiology, 1993–1998

Adjunct Professor, University of Toronto, Physical Education, 1988–1997

Research Associate, University of California, San Diego, Department of Medicine 1985–1986

Visiting Professor in Biomechanics, University of Guelph, Department of Human Movement Studies, 1983

Visiting Professor on Sabbatical leave, University of Waterloo, Department of Kinesiology, 1983–1984

Assistant Professor, University of Ottawa, Department of Kinanthropology, 1976–1984

Visiting Assistant Professor, York University, Department of Physical Education, Toronto, Canada, 1975–1976

## **Peer Reviewer**

Biomechanics Section, Canadian Journal of Applied Sports Sciences, 1978–1984

## **Professional Affiliations**

- Canadian Society for Biomechanics (President, 1981–1982)
- Canadian Association of Sport Sciences (Executive Member, 1981–1984)
- International Society of Biomechanics (Charter Member)
- American College of Forensic Examiners
- American Society for Testing and Materials