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Jay A. Mandell, Ph.D., P.E.

Professional Profile

Jay Mandell specializes in biomechanics and mechanical design analysis. His expertise includes nonlinear finite element analysis, with special focus on computational modeling of the musculoskeletal system, as well as experimental stress analysis and dynamics simulation. He has extensive professional experience in motor vehicle accident reconstruction, vehicle testing, the analysis of crash vehicle occupant dynamics, the application of human injury tolerance criteria to real-world accidents, and industrial and consumer product failure analysis. He also has significant experience in structural failure investigation and fire cause determination. His research interests include analytical modeling of the mechanical response of bone to orthopedic implants.

Dr. Mandell was previously Managing Engineer at Failure Analysis Associates, Inc. He also served as Senior Consulting Mechanical Engineer for FTI, Inc., and as Biomedical Engineer in Rehabilitation Research and Development for the Palo Alto Veterans Administration Health Care System.

Credentials and Professional Affiliations

B.S. (Mechanical Engineering), Stanford University, 1979

M.S. (Mechanical Engineering), Stanford University, 1986

Ph.D. (Mechanical Engineering), Stanford University, 1998

Registered Professional Mechanical Engineer, California, #23056

U.S. Patent #6,383,226, "Prostheses Having Curvilinear Collars," issued
May 7, 2002

Member, American Society of Biomechanics

Member, American Society of Mechanical Engineers

Member, ASM International

Member, Orthopaedic Research Society

Member, Society of Automotive Engineers

Member, Society for Experimental Mechanics

Member, American Association for the Advancement of Science

Selected Publications and Presentations

- “Safety Evaluation of Weightlifting Apparatus,” Proceedings of the 48th Annual Meeting of the Human Factors and Ergonomics Society, New Orleans, Louisiana, September 2004 (with R. Beyer et al.).
- “A Conical-Collared Femoral Stem Can Improve Stress Transfer and Limit Micromotion Compared to Conventional Designs,” ***Clinical Biomechanics***, Vol. 19, pp. 695–703, 2004 (with D.R. Carter et al.).
- “Factors Influencing Changes in Articular Cartilage Following Hemiarthroplasty in Sheep,” ***Journal of Orthopaedic Research***, Vol. 20, pp. 669–675, 2002 (with M.C.H. van der Meulen et al.).
- “Hip Hemiarthroplasty Outcome: Surgical Parameters and Articular Cartilage Destruction,” Transactions of the 44th Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana, March 1998 (with M.C.H. van der Meulen et al.).
- “Load Transfer in Cementless Intramedullary Prostheses,” Ph.D. thesis, Stanford University, 1998.
- “Prosthesis Collar Geometry Strongly Affects Initial Stress Shielding and Micromotion,” Proceedings of the 20th Annual Meeting of the Society for Biomaterials, Boston, Massachusetts, April 1994 (with G.S. Beaupré et al.).
- “The Influence of Femoral Component Collar or Taper on Stress Transfer and Micromotion,” Transactions of the 40th Annual Meeting of the Orthopaedic Research Society, New Orleans, Louisiana, February 1994 (with G.S. Beaupré, S.B. Goodman, and D.R. Carter).
- “Stress-related bone remodeling around total hip arthroplasty components,” Harrington Arthritis Research Institute Symposium on State-of-the-Art in Total Joint Replacement, Scottsdale, Arizona, November 1993 (with D.R. Carter et al.).
- “Compliant Fixation for Segmental Bone Replacement,” Proceedings of the 7th International Symposium on Limb Salvage, Singapore, August 1993 (with J.O. Johnston, D.L. Martin, and A.S. Turner).
- “A Comparative Study of Automatic Finite Element Mesh Generation Techniques in Orthopaedic Biomechanics,” 1993 Bioengineering Conference, Breckenridge, Colorado, June 1993, ASME BED-Vol. 24 (with C.R. Jacobs and G.S. Beaupré).
- “The Influence of Segmental Replacement Prosthesis Collar Geometry on Load Transfer in Long Bones,” Third U.S.A.-China-Japan Conference on Biomechanics, Atlanta, Georgia, August 1991 (with D.R. Carter et al.).

Selected Publications and Presentations (continued)

“Experimental Analysis of Interface Geometry in a Segmental Defect,”
Transactions of the 36th Annual Meeting of the Orthopaedic Research Society,
New Orleans, Louisiana, February 1990 (with W.E. Caler, D.R. Carter, and D.J.
Schurman).