

**JOHN W. STEEGE**

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**PERSONAL DATA**

Born: June 15, 1958  
Chicago, Illinois

**EDUCATION**

M.S. Northwestern University, June 1987  
Major: Theoretical and Applied Mechanics  
Thesis Topic: Fracture Mechanics of the  
Bone Cement Interface.

B.S. Northwestern University, June 1981  
Major: Mechanical Engineering  
Minor: Biomechanics

**SOCIETIES**

Member: ASME  
Member: MENSA  
Illinois Engineer in Training

**RESEARCH INTERESTS:**

Bioengineering finite element technique applications.  
Bioengineering and orthopaedic biomechanics.

**EXPERIENCE:**

July 1986  
to  
Present

Northwestern University, Chicago, Illinois  
*Design Engineer*: Member of the Northwestern  
University Rehabilitation Engineering Program's  
Prosthetic Research Laboratory involved in the  
computerization of prosthetic and orthotic  
techniques. Experience includes linear and non-  
linear finite element analyses (MARC, GIFTS, SAP) on  
personal (IBM) and mainframe (VAX, CDC)  
computers as well as workstations (UNIX). System  
administrator of mixed local area network. Also  
CAD/CAM, human subject work, transducer  
instrumentation, grant proposal preparation,  
supervision of engineering and medical students, and  
presentation of results at national scientific meetings.

June 1981  
to  
July 1986

Northwestern University, Chicago, Illinois  
*Research Engineer:* Member of the Northwestern University Rehabilitation Engineering Program's Biomechanics Unit involved in research and design of total joint replacements, particularly the knee and hip. Specific projects include studies of the bone-cement implant interface mechanics of total joint replacements, knee ligament mechanics and a Kinematic Knee prosthesis prospective study. Other studies have included properties of protective mouthguards and a mechanical analysis of metacarpal fracture fixation techniques. Experience included use of a materials testing machine, animal surgery, computer programming (CYBER, VAX, LSI, IBM, MAC), statistics (SPSS, BMDP), grant proposal preparation, and supervision of engineering and medical students.

June 1980  
to  
June 1981

Northwestern University, Evanston, Illinois  
*Technician:* Worked in a biomedical research lab investigating retinal response in the cat eye to light gratings varying in space, time, and contrast. Measurements were made of individual ganglion cell reactions to the stimuli. Experience included construction and debugging of electrical circuits and animal surgery.

March 1979  
to  
January 1980

Gould, Inc. Rolling Meadows, Illinois  
*Co-op Technician:* Part of a development team working to produce an evanescent wave optical fiber vibration and temperature sensor. Specific project involved polishing and mating two single mode fibers to produce evanescent coupling. Experience included use of lasers and optical tables.

June 1978  
to  
September 1978

Gould, Inc. Rolling Meadows, Illinois  
*Co-op Technician:* Part of a development team working to produce an array of piezoelectric non-contact printing ink jets.

## PUBLICATIONS

### JOURNAL ARTICLES

Lew, W. D., Lewis, J. L., Askew, M. J., and Steege, J., "Interaction of Knee Ligaments with the Geometry of Total Knee Replacements," Bulletin of Prosthetics Research, Vol. 19, No. 1, Spring, 1982, pp 83-84.

Askew, M. J., Steege, J. W., Lewis, J. L., Ranieri, and Wixson, R. L., "Effect of Cement Pressure and Bone Strength on PMMA Fixation," Journal of Orthopaedic Research, 1984, Vol. 1, pp 412-420.

Lewis, J. L., Keller, C., Stulberg, S. D., Steege, J., and Santare, M., "The Role of Fluid Hydrostatic Pressure in Bone/Implant Interface Load Transfer," Annals of Biomedical Engineering, 1984, Vol. 12, pp 559-571.

Steege, J.W., Schnur, D.S., Childress, D.S. "Prediction of Pressure at the Below-Knee Socket Interface by Finite Element Analysis," Biomechanics of Normal and Prosthetic Gait Symposium of the 1987 ASME Winter Annual Meeting, Boston, Massachusetts, December 13-18 1987, BED-Vol. 4, DSC-Vol. 6, pp. 39-44.

Steege, J. W. and Childress, D. S., "Finite Element Prediction of Pressure at the Below- Knee Socket Interface", Report of the ISPO Workshop on CAD/CAM in Prosthetics and Orthotics, Seattle, Washington, June 8-12, 1988, pp. 71-82.

Steege, J. W. and Childress, D. S., "Finite Element Modeling of the Below-Knee Socket and Limb: Phase II", Modeling and Control Issues in Biomechanical Systems Symposium of the 1988 ASME Winter Annual Meeting, Chicago, Illinois, November 28 to December 2 1988, BED-Vol. 11, DSC-Vol. 12 pp. 121-129.

Branson, P. J., Steege, J. W., and Wixson, R. L., Lewis, J.L., and Stulberg, S.D. "Rigidity of Internal Fixation With Uncemented Tibial Knee Implants", Journal of Arthroplasty, 1989, Volume 4, Number 1, pp. 21-26.

Chai, J. and Steege, J. W., "Effects of Labial Margin Design on Stress Distribution of a Porcelain-Fused-to-Metal Crown", Journal of Prosthodontics, 1992, Volume 1, Number 1, pp. 18-23.

Silver-Thorn, M. B., Steege, J. W., and Childress, D. S. "A Review of Prosthetic Interface Stress Investigations", Accepted for Publication Journal of Rehabilitation Research and Development.

#### MEETING ABSTRACTS

Stowe, D. W., Brandes, A., Beasley, J., Kopera, P., Slonecker, M., Steege, J., and Tekippe, V., "Hardening the Single-Mode Fiber Evanescent-Wave Coupler," presented at American Ceramic Society, Chicago, Illinois, April, 1980.

Keller, C., Lewis, J. L., Stulberg, S. D., Steege, J., Szela, E., Santare, M., and Hori, R. Y., "The Role of Fluid Hydrostatic Pressure in Bone/Implant Interface Load Transfer," Orthopaedic Research Society Transactions, March, 1983, Vol.8, pg. 157.

Steege, J. W., Askew, M. J., Ranieri, J. R., and Serletti, J., "Cement Pressure and Bone Strength Effect on PMMA Fixation of Joint Implants," Orthopaedic Research Society Transactions, March, 1983, Vol. 8, pg. 229.

Askew, M. J., Steege, J. W., Lewis, J. L., Ranieri, J. R., Serletti, J., and Wixson, R. L., "Bone Strength Effects and Fixation of Pressurized PMMA," The Society for Biomaterials Transactions, April 27-May 1, 1983, pg. 36.

Steege, J. W., Askew, M. J., Ranieri, J. R., Serletti, J., Wixson, R. L., and Lewis, J. L., "Cement Pressure and Bone Strength Effects on PMMA Fixation of Joint Implants," Orthopaedic Transactions, 1983, pg. 229.

Lewis, J. L., Keller, C., Stulberg, S., and Steege, J., "Bone-Prosthesis Interface," Annals of Biomechanical Engineering, Vol. II, No. 1, 1983, pg. 38.

Lewis, J. L., Nicola, T., Keer, L. M., Clech, J. P., Steege, J. W., and Wixson, R. L., "Failure Processes of the Cancellous Bone-PMMA Interface," Orthopaedic Research Society Transactions, January, 1985, Vol. 10, pg. 144.

Clech, J. P., Lewis, J. L., Keer, L. M., and Steege, J. W., "Mechanical Failure Processes and Models at the Bone-Cement Interface," ASME Biomechanics Symposium, Albuquerque, N.M., June, 1985.

Steege, J. W., Polizos, T., Lewis, J. L., and Wixson, R. L., "Failure Mechanisms in PMMA Around Loaded Tibial Components," Orthopaedic Research Society Transactions, February, 1986, Vol. 11, pg. 355.

Steege, J. W., Polizos, T., Lewis, J. L., and Wixson, R. L., "Failure Mechanisms in PMMA Around Loaded Tibial Components," Orthopaedic Transactions, 1986.

Steege, J. W., Lewis, J. L., Keer, L. M., and Wixson, R. L., "Crack Propagation at the Bone-Cement Interface," Orthopaedic Research Society Transactions, February, 1987, Vol. 12, pg. 54.

MEETING ABSTRACTS (CONTINUED)

Branson, P., Steege, J. W., Wixson, R. L., and Stulberg, S. D., "Rigidity of Initial Fixation in Non-Cemented Total Knee Tibial Components," Orthopaedic Research Society Transactions, February, 1987, Vol. 12, pg. 293.

Steege, J. W., Schnur, D. S., Van Vorhis, R. L., and Rovick, J., "Finite Element Analysis as a Method of Pressure Prediction in the Below-Knee Socket," Rehabilitation Engineering Society of North America 10th Annual Conference Proceedings, June, 1987, pp. 814-816.

Steege, J. W., Lewis, J. L., Keer, L. M., and Wixson, R. L., "Crack Propagation at the Bone- Cement Interface," Orthopaedic Transactions, 1987.

Branson, P., Steege, J. W., Wixson, R. L., and Stulberg, S. D., "Rigidity of Initial Fixation in Non-Cemented Total Knee Tibial Components," Orthopaedic Transactions, 1987.

Vannah, W.M, Childress, D.S., and Steege, J.W., "Qualitative Aspects of the Mechanical Response of Living Muscular Tissue Under Compressive Loads", Proceedings of the 12th Annual Meeting of the American Society of Biomechanics, September 28-30, 1988, Champaign, Illinois, pp. 214-215.

Steege, J. W., Silver-Thorn, M. B., and Childress, D. S., "Design of Prosthetics Sockets Using Finite Element Analysis", Proceedings of the 7th World Congress of the International Society for Prosthetics and Orthotics, Chicago, Illinois, June 28 to July 3, 1992, pg. 273.

Silver-Thorn, M. B., Steege, J. W., and Childress, D. S., "Measurements of Below-Knee Residual Limb/Prosthetic Socket Interface Pressures", Proceedings of the 7th World Congress of the International Society for Prosthetics and Orthotics, Chicago, Illinois, June 28 to July 3, 1992, pg. 280.

Childress, D., Rovick, J., Steege, J., Silver-Thorn, B., and Chan, R., "Advanced Engineering Approaches to Prosthesis Socket Design and Manufacture", Proceedings of NCMMR Conference on Advancing Technology / Enhancing Ability: Prosthetic / Orthotic Research for the 21st Century, Washington D.C. 1992, pp. 205-209.

Steege, J. and Childress, D., "Analysis of Trans-Tibial Prosthetics Gait Using the Finite Element Technique" Twenty-first Annual Meeting of the American Academy of Orthotists and Prosthetists, New Orleans, LA, March 21-25, 1995, pp. 13-14.

Steege, J.W. and Childress, D.S., "Finite Element Analysis of Below-Knee Prosthetic Gait" 1995 International Mechanical Engineering Congress and Exposition - ASME Winter Annual Meeting, San Francisco, CA, November 12-17, 1995, pp. 137-138.