

CURRICULUM VITAE

PERSONAL DATA

Joan E. Bechtold, Ph.D.
U.S.A

ADDRESS

Midwest Orthopaedic and Minneapolis Medical Research Foundations
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EDUCATION

University of Minnesota, Minneapolis, Minnesota

Ph.D. Mechanical Engineering (1987)

Thesis title: "Anatomic Design of Orthopaedic Implants: Parametric Design Analysis of an Intramedullary Nail Using Techniques of Computer Aided Geometric Design and Analytic Beam Theory"

M.S.M.E. Mechanical Engineering (1983)

Thesis title: "Three-dimensional Laser Scanning System with Application to Gait and Robotics"

Michigan State University, East Lansing, Michigan (1976-1979)

B.S.M.E. Mechanical Engineering (Minor - Biomedical Engineering)

University of Chicago, Chicago, Illinois (1975-1976)

general coursework

ACADEMIC APPOINTMENTS

Assistant Professor (1988 – present)

Department of Orthopaedic Surgery, University of Minnesota, Minneapolis, MN.

(Committee on Aging Research (2001), MD/PhD Admissions Committee (2002-present))

Associate Professor (1989 – present)

Department of Biomedical Engineering, University of Minnesota, Minneapolis, MN

(Graduate Admissions Committee (1999-2002), Lecturer, BMEn5002)

Assistant Professor (2003 – present)

Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN.

Adjunct Professor, experimental implant surgery (2005 – present)

University of Aarhus, Aarhus, Denmark.

SCIENTIFIC ACTIVITIES

Journal of Biomechanics –

- Editorial Consultant (1998-)
- Editorial Board (1999) and American Society of Biomechanics Representative
- Survey Editor (2000-2005)

Journal of Orthopaedic Trauma –

- Editorial Consultant

Proceedings of NACOB II, The Second North American Congress on Biomechanics, Chicago, IL, August, 1992.

Peer reviewer -- Grants:

- NIH (NIAMS Orthopaedic Study Section;
Skeletal Biology and Skeletal Regeneration)
(*ad hoc* (2002-2004) *permanent membership* (2004-present))
- NIH (Minority Biomedical Research Support Program;
National Institute of General Medical Sciences) 2002.
- NIH (R21 High Risk RFA) 2004
- NIH (Tissue Engineering), 1998
- NIH (Institute of Child Health and Human Development), 1993.
- National Center for Injury Prevention (2004)
- Veteran's Administration (Orthopaedics) (2001, 2003) (*ad hoc*)
- Allegheny-Singer Research Institute, Pittsburgh, PA, 1992-1993.
- Biomedical Interfacial Engineering, NSF Science Center, 1993.
- NIH/MMRF Biomedical Research Support Grant -, 1993.

Peer Reviewer - Journals:

- Journal of Biomechanical Engineering
- Journal of Biomechanics (Editorial Advisory Board)
- Journal of Bone and Joint Surgery (American and British)
- Journal of Orthopaedic Research
- Journal of Orthopaedic Trauma (Editorial Advisory Board)
- Orthopedics
- Biomaterials
- Tissue and Cell Report

GRANTS AND CONTRACT SUPPORT NIH and DEPARTMENT OF DEFENSE

1. RO1: NIH - NIAMS

- "Failure Mechanisms of Revision Joint Replacement"*,
P.I. **Joan E. Bechtold, Ph.D.**
Co-I Kjeld Søballe, M.D., Ph.D., Aarhus University
(1996-2001) R29 AR42051-01A2, \$434,348.
(2001-2004) R01 AR42051-06, \$810,329.
(2004-2009) R01 AR42051-12. \$1,027,488.

2. "Musculoskeletal Training Grant": NIH - NIAMS

P.I. Denis Clohisy, University of Minnesota Dept. of Orthopaedic Surgery
07/01/04 – 06/30/09
\$1,557,041

Department wide, support 3 graduate students and 2 postdoctoral students annually, to perform research and train in orthopaedic sciences.

Joan E. Bechtold, Ph.D. is on grant faculty team.

3. Orthopaedic Trauma Research Program: U.S. Department of Defense

“New Bone Formation in a Chronically Infected Segmental Defect in the Rat Femur Treated with BMP-2 and Antibiotic”

P.I. David Polly, M.D., University of Minnesota Dept. of Orthopaedic Surgery
01/01/07 -12/31/08

\$466,664.

Joan E. Bechtold, Ph.D.: PI for MMRF subcontract (estimate: \$400,000)

4. Orthopaedic Trauma Research Program: U.S. Department of Defense

“Polymicrobial Chronic Infection Including acinetobacter baumannii in a Plated Segmental Defect in the Rat Femur”

P.I. Dean Tsukayama, M.D., Head, MMRF/HCMC Musculoskeletal Sepsis Unit
01/01/07 -12/31/08

\$418,647

Joan E. Bechtold, Ph.D. : Co-I

5. SBIR Phase I (NIH/AMSD) 01/07/06-30-06-07

“MultiDrug Delivery Microparticle Coatings for Orthopedic Devices”

PI: Patrick Guire, Ph.D., IsurTec, Inc.

Joan E. Bechtold, Ph.D.: Consultant.

\$3,000

6. SBIR Phase I and Phase II (DoD): U.S. Department of Defense 2005 (Phase I); 2006-07 (Phase II)

“Antimicrobial Bone Graft Substitute” PI: Michael Danilich, Luna Innovations

Joan E. Bechtold, Ph.D.: P.I. for subcontract to MMRF from Luna Innovations.

\$30,000.

7. SBIR Phase I (NIH): 9/15/02 – 8/31/03

“Sensor of Femoral Implant Subsidence”

PI: Steven W. Arms, Microstrain, Inc.

Joan E. Bechtold, Ph.D.: P.I. for subcontract to MMRF from Microstrain, Inc,

\$30,000.

8. SBIR Phase I (NIH): 11/01/02 – 5/1/03

“Development of a Spinal Intervertebral Disc Prosthesis”

PI: Glenn R. Buttermann, MD

Joan E. Bechtold, Ph.D.: P.I. for subcontract to MMRF, laboratory subcontract. To support feasibility studies for intervertebral disc replacement prosthesis.

\$30,000.

9. SBIR Phase II (NIH): 04/10/2001-03/31/03 (no cost extension to 3/31/04);

“Clinical studies of tissue ultrafiltration to improve diagnosis and reduce tissue pressure by removing fluid volume.”

P.I.'s. Wm. Fowler, Rick M. Odland, M.D., Ph.D., Twin Star Medical

Joan E. Bechtold, Ph.D.: _P.I. for subcontract to MMRF from Twin Star Medical, consultant
\$2,000.

- 10. NIH/Minneapolis Medical Research Foundation;** Biomedical Research Support Grant
"Instrumented Spatial Linkage for Three-Dimensional Motion Measurement",
Joan E. Bechtold, Ph.D., P.I. (1992-1993)
\$6,000.00

**GRANTS AND CONTRACT SUPPORT
UNIVERSITY OF MINNESOTA**

Minnesota Partnership for Biotechnology and Medical Genomics (U of MN and Mayo Clinic)

"Development of Ultra-Small Sensors for Accurate Quantification of Muscle Forces in Neuromuscular Diseases" (2005-2006) \$250,000.

P.I. Rajesh Ragamani, Ph.D., University of Minnesota, Kenton Kaufman, Ph.D., Mayo Clinic,
Joan E. Bechtold, Ph.D. : Consultant
\$18,466.

Biomedical Engineering Institute (U of MN)

"Supporting infrastructure of Orthopaedic Biomedical Engineering" (2003-2006)

Co-I: **Joan E. Bechtold, Ph.D.**, Jack Lewis
\$125,000 – graduate student and seed funds.

Transdisciplinary Tobacco Use Research Center (U of MN)

11/15/03 – 8/31/04 \$9,000.

"Separate Effects of Tobacco Extract and Nicotine on Fracture Repair in Rats"

PI: **Joan E. Bechtold** Co-I: Kjeld Søballe, M.D., Ph.D. Aarhus University

Collaborative pilot study to develop model to study effects of tobacco extract and nicotine on fracture repair in rats.

Minnesota Supercomputing Institute:

"Computational evaluation of Bone-Implant Interface"

Joan E. Bechtold, Ph.D., P.I.

Research Scholar award to Oliver Mouzin (2000-2001)
\$15,000.

**GRANTS AND CONTRACT SUPPORT
OTHER FUNDING AGENCIES**

Small Grants Program, (Hennepin County Medical Center)

“Separate and Combined effects of Nicotine and Tobacco Extract on Fracture repair”,
Joan E. Bechtold P.I.
Co-I's: Kjeld Søballe, M.D., Ph.D. Aarhus University, Xinqian Chen, M.D.,
Minneapolis Medical Research Foundation, Minneapolis, MN (2005-2006),
\$35,000

Conseil Regional Midi Pyrennees, France

“Analysis of the in-vivo behavior of orthopaedic implants, development of sensors.”
Prof. Pascal Swider, Ph.D. P.I.,
Co-I: **Joan E Bechtold, Ph.D.** (2000 -2003),
\$20,000.

Arthritis Foundation:

"Revision versus Primary Replacement of Arthritic Joints",
Joan E. Bechtold, Ph.D. P.I. (1995-1998),
\$224,988.

Minnesota Medical Foundation:

"Stability of Hip Joint Prosthesis as a Function of Bone Density and Prosthesis Design",
Joan E. Bechtold, Ph.D., PI (1995-1996),
\$3,000.

Orthopaedic Research and Education Foundation (OREF):

"Failure Mechanisms of Revision Joint Replacement",
Joan E. Bechtold, Ph.D., P.I. (1993-1994),
\$99,904.00

Minnesota Medical Foundation (MMF):

"Mechanical Pressures on the Human Patella",
Joan E. Bechtold, Ph.D., P.I. (1993-1994),
\$5,000.00

Whitaker Foundation:

"Mechanical Pressures on the Human Patella",
Joan E. Bechtold, Ph.D., P.I. (1991-1994),
\$180,000.00

Minnesota Supercomputer Institute:

"Stresses in Polyethylene of Acetabular Cups",
Joan E. Bechtold, Ph.D., P.I. (1991-1994),
15 Units/Cray XMP

Hennepin Faculty Associates:

"Stresses in Polyethylene of Acetabular Cups",
Joan E. Bechtold, Ph.D./Richard F. Kyle, M.D., P.I.'s, (1991-1994),
\$60,784.00

Hennepin Faculty Associates Capital Equipment Grant:

"Computerized Imaging for Analysis and Design of Joints and Implants",
Joan E. Bechtold, Ph.D./Richard F. Kyle, M.D., P.I.'s (1990),
\$23,000.00

Hennepin Faculty Associates Competitive Grant Program:
"Pressure under the Articular Cartilage of the Human Patella",
Joan E. Bechtold, Ph.D./Ramon B. Gustilo, M.D., P.I's (1988-1991),
\$14,927.67

Hennepin Faculty Associates Competitive Grant Program:
"Reconstruction of Severe Acetabular Defects after Failed Total Hip Arthroplasty",
Joan E. Bechtold, Ph.D./Ramon B. Gustilo, M.D., PI's (1987-1991),
\$44,899.19

Berivon Foundation:
"Rotational Stability of Forearm Fractures fixed with Plates, Rush Rods and Fracture Brace",
Joan E. Bechtold, Ph.D./Robert L. Merkow, M.D., P.I's, (1986),
\$3,000.00

Hennepin County Medical Center and Metropolitan Medical Center:
"Geometric and Structural Analysis of Intramedullary Implants",
Joan E. Bechtold, Ph.D., P.I., (1984-1987)dissertation salary support
\$20,000.

Association for the Study of Internal Fixation:
"Geometric Analysis of Intramedullary Nails",
Joan E. Bechtold, Ph.D., PI. (1983-1984),
\$3,000.00

HONORS AND AWARDS

- American Society of Biomechanics, 1995 Travel Award
- American Society for Testing and Materials MOSES award, 1997
- Danish Orthopaedic Society , "First place, Best research Paper", (Søballe, 1997, Jensen, 2000, Elmengaard 2002)
- Acta Orthopaedica Scandinavica "best manuscript, Year 2001" (Søballe)
- European Hip Society, "Best paper award", (Kold) 2002.
- Danish Orthopaedic Society, "First place, Best Poster", (Vestergaard) 2005, 2006.
- Harris Hip Award, Orthopaedic Research Society, (Elmengaard) 2005.

Professional Jury –

Borelli Award, Pre- and Post-Doctoral Young Scientist Award, Clinical Biomechanics and Journal of Biomechanics Awards (American Society of Biomechanics, Chair, Awards Committee, 2004, 2005)

New Investigator Research Award (Orthopaedic Research Society) 2003.

Clinical Biomechanics Award (European Society of Biomechanics meeting) 2000

Mechanical Engineering Design Show (ME 4054), University of Minnesota
2000-2006

Mechanical Engineering Robot Show (ME 2011), University of Minnesota
1999-2005.

HONARARY SOCIETIES

Tau Beta Pi
Pi Tau Sigma (Engineering)
Phi Kappa Phi

AWARD PAPERS

Søballe, K., **Bechtold, J.**, Overgaard, Gustilo, R.: Effects of hydroxyapatite coating and/or bone graft on the interfacial strength of primary and revision implants, Dansk Ortopaedisk Selskab Award Paper Oktober 1997.

Bock SH, **Bechtold, JE**, Kraft M., Boenick, U: Untersuchung des Einflusses von iatrogenen Schaedigungen auf Marknaegel, *1st Prize*, German Society for Biomedical Technic, Dresden, Germany, 1998.

Søballe, K., **Bechtold, J.**, Overgaard S., Bungler, C., Lind, M.: Differential response to Op-1 in primary and revision implants, Danish Ortopaedic Society, København, Oktober, 1998.

Kold, S., Søballe, K., Mouzin, O., Chen, X., Toft, M., **Bechtold, J.E.**: Fixation of revision implants is improved by new surgical technique to crack the sclerotic endosteal rim, *Award paper, Hip International* 2002;12(2)77-78.

Søballe, K., Mouzin, O.R.G., Kidder, L.A., Overgaard, S., **Bechtold, J.E.** The effect of hydroxyapatite coating and bone allograft in fixation of loaded experimental primary and revision implants, (*2001 best paper award*), *Acta Orthopaedica Scandinavica*; 74 (3):239-247, 2003.

Elmengaard, B., **Bechtold, J.**, Chen, X., Søballe, K. Fixation of Hydroxyapatite Coated Revision Implants is Improved by Cracking the Sclerotic Bone Rim, (*2005 William Harris Hip Award, Orthopaedic Research Society*), *J. Orthopaedic Research*, in press.

Jakobsen, T., Kold, S., **Bechtold, J.**, Elmengaard, B., Søballe, K. "Topical bisphosphonate treatment increases fixation of implants inserted with bone compaction. 12 weeks canine study" *2005 best poster award, Danish Orthopaedic Society Spring meeting*.

PRESENT APPOINTMENTS

- Director, Orthopaedic Biomechanics Laboratory, Minneapolis Medical Research Foundation, Midwest Orthopaedic Research Foundation (4/84)
- Vice President/Treasurer, Midwest Orthopaedic Research Foundation at Hennepin County Medical Center (4/92)
- Assistant Professor, Department of Orthopaedic Surgery, University of Minnesota (5/88)
- Associate Professor, Graduate Faculty, Department of Biomedical Engineering, University of Minnesota (9/89) (Member, MD/Ph.D. admissions committee, former member Graduate Admissions committee)
- Assistant Professor, Department of Mechanical Engineering, University of Minnesota (6/03)
- Professor of Experimental Surgery, Aarhus University, (5/05), Aarhus Denmark
- Board of Directors, Gustilo Medical Education Center (2/2005), formerly Orthopaedic Learning Center, Hennepin County Medical Center (10/89)
- Founding Board Member, Minneapolis Lifesciences Corridor (12/03)
- Member of Board, World Council of Biomechanics, (2002-20014)
- Member, Working Party on Biomechanics, International Union of Theoretical and Applied Mechanics (2003).

RESEARCH AND PROFESSIONAL EXPERIENCE:

Director of Orthopedic Biomechanics Laboratory (1984-present)

Midwest Orthopaedic Research Foundation

(at Hennepin County Medical Center and Minneapolis Medical Research Foundation, Minneapolis, Minnesota)

- responsible for administration of laboratory, and all phases of all research projects conducted by laboratory personnel and research fellows, including project initiation and direction, protocol development, proposal writing, testing and data gathering, data analysis, publication, and budgets.

Assistant Professor (1988 – present)

Department of Orthopaedic Surgery, University of Minnesota, Minneapolis, MN.

(Committee on Aging Research (2001), MD/PhD Admissions Committee (2002-present))

Associate Professor (1989 – present)

Department of Biomedical Engineering, University of Minnesota, Minneapolis, MN

(Graduate Admissions Committee (1999-2002), Lecturer, BME5002)

Assistant Professor (2003 – present)

Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN.

Professor, experimental implant surgery (2005 – present)

University of Aarhus, Aarhus, Denmark.

Board Member, Midwest Orthopaedic Research Foundation (1990-present)

Treasurer Midwest Orthopaedic Research Foundation (1997- present)

Board Member, Minneapolis Medical Research Foundation, Minneapolis, MN (2002-2006)

Founding Board Member, Minneapolis Lifesciences Corridor, (2003-)

Visiting Scientist, Department of Orthopaedic Surgery and Biomechanics Laboratory, Orthopaedic Hospital, Aarhus, Denmark (1995, 1997, 1999, 2001, 2002, 2004, 2006)

Sabbatical leave Department of Orthopaedic Surgery and Biomechanics Laboratory, Aarhus University Hospital, Aarhus, Denmark (2001, 2006).

Senior Visiting Scientist, Niigata University (March, 1994, March 1998)
- Fogarty/NIH Visiting Scientist, Japan Science Foundation

Research Associate, Mueller Institute for Biomechanics, Bern, Switzerland (1983)
- completed research project developing and implementing methodology to assess geometric fit of orthopedic implants within bones.

Research Assistant, Motion Laboratory at Mechanical Engineering Department, University of Minnesota (1981-1983)
- developed algorithms to track points in three-dimensional space, using laser scanning system.

Bioengineer and Programmer, Mayo Clinic Orthopedic Biomechanics Laboratory, Rochester, Minnesota (1979-1981)

- materials testing engineer (orthopedic and dental materials), computer manager for laboratory, with concentration on gait analysis data acquisition system.

Undergraduate Research Assistant, Anatomy Department, Michigan State University (1976-1979)
- developed and implemented kinematic analysis for neck motion asymmetry study.

MEMBERSHIPS AND OFFICES IN PROFESSIONAL SOCIETIES

American Academy of Orthopaedic Surgeons,
Orthopedic Research Society,
American Society of Biomechanics
European Society of Biomechanics
American Society of Mechanical Engineers
Society for Biomaterials
American Society of Testing and Materials
World Congress of Biomechanics

TEACHING AND MENTORING ACTIVITES

University of Minnesota:

Darin Friess, M.D. (Trauma fellow, HCMC and University of Minnesota) research rotation

Jessica Cooper, M.D. (Trauma fellow, HCMC and University of Minnesota) research rotation

Krista Evans, M.S. (Biomedical Engineering, University of Minnesota) thesis committee

Wook-Jin Seong, D.D.S., M.S., F.A.C.P. (Dental School and Dental Biomechanics, University of Minnesota) thesis committee

Arnaud VanWettere, D.V.M., M.S. (fellow, Raptor Center, University of Minnesota) thesis committee

Trish Kallemeier, M.D. (resident, University of Minnesota) resident research project

David Polga, B.S. (medical student, University of Minnesota) medical student research project

Brian Beaubien, B.S. (Master's student, Mechanical Engineering, University of Minnesota)
Thesis committee, undergraduate honors project committee

Patrick Ebeling, M.D. (resident, Orthopaedic Surgery, University of Minnesota) resident research project

Marisa Sylvester, B.S. (REU, Biomedical Engineering, Louisiana State University, Baton Rouge, LA) undergraduate intern

Robert Gilley, D.V.M, Ph.D. (Veterinary Medicine, University of Minnesota) thesis committee

Jalila Abu, D.V.M., Ph.D. (Veterinary Medicine, University of Minnesota) thesis committee

Kyle Matthews, D.V.M., Ph.D. (Veterinary Medicine, University of Minnesota) thesis committee

Chip Comadoll, M.D. (resident, Orthopaedic Surgery, University of Minnesota) resident research project

Tom Nelson, M.D. (resident, Orthopaedic Surgery, University of Minnesota) resident research project

Paul Diekmann, M.D. (resident, Orthopaedic Surgery, University of Minnesota) resident research project

Peter Holmberg, M.D. (resident, Orthopaedic Surgery, University of Minnesota) resident research project

Sara Rockswold, M.D. (resident, formerly Orthopaedic Surgery, University of Minnesota) resident research project

David Strothman, M.D. (research assistant, now in Orthopaedic Surgery Department, University of Minnesota) medical student project advisor

Steven Chow, M.S. (Biomedical Engineering, University of Minnesota, currently medical student, University of Minnesota) thesis committee

Brian Hannon, B.S. (REU, University of Nebraska) undergraduate intern

Sara Efflandt, Ph.D. (Chemical Engineering and Materials Science, University of Minnesota) undergraduate intern

Ryan Collins, M.S. (Biomedical Engineering, University of Minnesota) thesis committee and advisor

Kristin Johnson, M.S. (Chemical Engineering and Materials Science, University of Minnesota) thesis committee and advisor

Marie Guion Johnson, M.S., Ph.D. (Mechanical Engineering, University of Minnesota)

Todd Gengerke, B.S. (REU, University of Iowa, medical student, University of Minnesota) undergraduate research project

Hirak Chanda, M.S. (Mechanical Engineering, University of Minnesota) thesis committee
Cheryl Riddle, (REU, Duke University, then medical student, Duke University, Raleigh Durham, NC) undergraduate research project
Tracey McCarthey, M.D. (REU, currently Ph.D. student, Rehabilitation Medicine at Loyola University, Chicago, IL) undergraduate research project
Randall Zimmerman, M.D. (medical student, University of Minnesota) medical student project
Kelly Grimes, M.S. (Biomedical Engineering, University of Minnesota) thesis committee and advisor
Jennifer Pavlovic, Ph.D. (Biomedical Engineering, University of Minnesota) thesis committee and advisor
Michael Campbell, M.S. (Mechanical Engineering, University of Minnesota) thesis committee and advisor
Susan Sandvig, M.S. (Mechanical Engineering, University of Minnesota) thesis committee and advisor
Jude Sasing, M.S. (Biomedical Engineering, University of Minnesota) thesis committee and advisor
Nancy Pistole, M.S. (Mechanical Engineering, University of Minnesota) thesis committee and advisor

Students: Other Institutions_(co-advisees, mentors)

Sidsel Hastrup (medical student research year, University of Aarhus, Denmark)
Thomas Vestergaard Jakobsen (medical student, doctoral student, Orthopaedic Surgery, University of Aarhus, Denmark)
Henrik Daugaard, M.D. (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)
Anders Lamberg, M.D. (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)
Joergen Baas, M.D. (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)
Søren Kold, M.D. Ph.D. (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)
Thomas Bo Jensen, M.D. (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)
Brian Elmengaard, M.D. (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)
Marianne Vestermark Toft, M.D. (medical student research year, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)
Christian Rahbek (medical student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)
Helle Pedersen (medical student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)

Thomas Vestergard Jacobsen (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus Denmark)

Dea Matthiesen (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus, Denmark)

Martin Skøtt (medical student, Orthopaedic Surgery, University of Aarhus, Aarhus, Denmark)

Mette Oerskov (doctoral student, Orthopaedic Surgery, University of Aarhus, Aarhus, Denmark).

Olivier Mouzin, Ph.D. (post-doctoral, Biomechanics, University of Toulouse, Toulouse, France)

Annaig Pedrono, (Ph.D. candidate, Mechanical Engineering, University of Toulouse, Toulouse, France)

Michael Quick, M.D. (Research Assistant, Orthopaedic Surgery, Freiburg University, Freiburg Germany)

Sven Bock, B.S. (Research Internship Mechanical Engineering, Berlin Technische University, Berlin, Germany)

Rolando Puno, M.D. (research fellow, Orthopaedic Surgery, University of Philippines, Manila, Philippines, currently private and academic practice, Louisville, KY)

Yoichirio Dohmae, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Hitoshi Shimagaki, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Hideaki Touchi, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Yoshinori Takahashi, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Takeashi, Sato, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Naoaki Onda, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Ten Sobue, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Hiro Segawa, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Go Omori, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Yoshinori Ishii, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Taka Seki, M.D. (research fellow, Orthopaedic Surgery, Niigata University, Niigata Japan)

Toshiaki Kitsugi, M.D. (research fellow, Orthopaedic Surgery, Kyoto University, Kyoto, Japan)

Keerati Chareancholvanich, M.D. (research fellow, Orthopaedic Surgery, Mahidol University, Bangkok Thailand)

Nung Lo, M.D. (research fellow, Orthopaedic Surgery, University of Singapore, Singapore)

Luiz Sergio Marcelino Gomes, M.D. (research fellow, Orthopaedic Surgery, Sao Paulo Brazil)

Sun, Bing-nan, (post-doctoral, Department of Civil Engineering, Zheziang University, Hangzhou, People's Republic of China)

Mentor Connection (high school seniors, Metropolitan Twin Cities, Minnesota)

Derek Southwell

Joseph Klaers

Sandy Vang

Stacey Tsukayama

Brad Froehle

Daniel Parrish

Lauren Marinaro

EXTRAMURAL INVITED PRESENTATIONS

Visiting Professor, Mayo Clinic Biomedical Engineering Department, November, 2005.

Philippines Orthopaedic Society, Invited Speaker, Manila, November, 2004.

Invited speaker, Biomedical Engineering Society, Philadelphia, October, 2004.

Visiting Professor, University of Iowa, Iowa City, 2004

Visiting Professor, University of Massachusetts, Amherst, 2003.

Visiting Professor, University of Louisville Department of Orthopaedic Surgery, October 2003.

X Brazilian Hip Society, Symposium on Orthopaedic Technology, September 5, 2003, Rio de Janeiro, Brazil.

“32nd Annual Hennepin County Medical Center Orthopaedic and Trauma Seminar”, October 17-19, 2002.

“31st Annual Hennepin County Medical Center Orthopaedic and Trauma Seminar”, November 29-December 1, 2001.

“30th Annual Hennepin County Medical Center Orthopaedic and Trauma Seminar”, November 2-4, 2000.

Resident research conferences, Orthopaedic Learning Center, Hennepin County Medical Center, 1990 – present.

Biomedical Engineering Seminar Series, Mayo Clinic, April 28, 2000.

“Clinical Relevance in Biomechanics Research”, Workshop, 12th Conference of the European Society of Biomechanics, Dublin, Ireland, 2000.

“Recent research in biomechanics related to trauma and joint replacement”, University of Paul Sabatier, Toulouse, France, 2000.

- "The role of motion and particulate matter in revision joint replacement", Biomedical Engineering Society Special Emphasis Symposium on Joint Replacement, Cleveland, Ohio, October, 1998.
- "Synergy between implant motion and particulate polyethylene in the formation of an aggressive periprosthetic membrane", International Sun Valley Workshop on Hard Tissue Biology, August, 1998.
- "Hydroxyapatite in Primary and Revision Joint Replacements", Charite' Hospital, Humboldt University, Berlin, Germany, May, 1998.
- "Strategies and Methodologies for Applied Biomechanics Research", Departments of Biomedical and Mechanical Engineering, Niigata University, Niigata, Japan, March, 1998.
- "Applied Orthopaedic Research in Joint Replacement and Fracture Fixation", Visiting Scientist, Orthopaedic Hospital, Aarhus, Denmark, October, 1995.
- "The Mechanics of Reaming", Annual Hennepin County Medical Center Orthopaedic and Trauma Seminar, Minneapolis, MN: October, 1995.
- "Biomechanics and Design of Current Intramedullary Rods", Annual Hennepin County Medical Center Orthopaedic and Trauma Seminar, Minneapolis, MN: October, 1994.
- "Effect of Implant Stability on Bone Ingrowth", University of Minnesota Biomedical Engineering Seminar, Minneapolis, MN: January, 1993.
- "Design of Cemented Femoral Components of Total Hip Replacement", Hennepin County Medical Center, 27th Annual Orthopaedic and Trauma Seminar: October, 1992.
- "Design Criteria for Patellar Prosthesis", Hennepin County Medical Center, 26th Annual Orthopaedic and Trauma Seminar: September, 1991.
- "Biomechanics of the Long Curved Femoral Stem", Hennepin County Medical Center, 25th Annual Orthopaedic and Trauma Seminar: October, 1990.
- "Biomechanics of Fracture Fixation", University of Louisville, Department of Orthopaedic Surgery: 1990.
- "Biomechanics of Short Stem vs. Long Stem", Hennepin County Medical Center, 22nd Annual Orthopaedic and Trauma Seminar: October, 1988.
- "Superior Placement of Acetabular Component--An Anatomic and CT Study", Hennepin County Medical Center, 22nd Annual Orthopaedic and Trauma Seminar: October, 1988.
- "Biomechanical Analysis of Stability of Different Uncemented Tibial Components", Hennepin County Medical Center, 21st Annual Orthopedic and Trauma Seminar: October, 1987.
- "Biomechanics of Fracture Fixation", 18th Annual Orthopedic and Trauma Seminar, Hennepin County Medical Center: October, 1984.

"Design of Intramedullary Nails - Geometric Factors", Association for the Study of Internal Fixation-AO Tagung, Bern, Switzerland: 1983.

MODERATOR and SYMPOSIUM ORGANIZER

- Awards Session organizer, American Society of Biomechanics, Portland, OR, September, 2004.
- Session, Gordon Conferences on Orthopaedics, New Hampshire, July, 2004.
- Session organizer, "Design of Medical Devices Conference", University of Minnesota, April, 2004, April 2005
- Moderator, 48th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, 2003.
- Moderator, 12th Annual Meeting of European Society of Biomechanics, Knee Biomechanics, Dublin, Ireland, 2000.
- Moderator, 43rd Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, 1997.
- Moderator, Combined Meeting of the Orthopaedic Research Societies of Japan, Canada, The United States and Europe, San Diego, CA, 1995.
- Moderator, American Society of Biomechanics Annual Meeting, Stanford, CA, 1995.
- Moderator, Orthopaedic Research Society, Orlando, FL, 1995.
- Moderator, Orthopaedic Research Society, San Francisco, CA, 1993.
- Moderator, American Society of Biomechanics, Tempe, AZ, 1991.
- Moderator, American Society of Biomechanics, Miami, Florida, 1990.
- Moderator, Biomechanics Symposium, American Society of Mechanical Engineers, San Diego, 1989.
- Moderator, Winter Annual Meeting, American Society of Mechanical Engineers, Boston Massachusetts, 1987.
- Medical Devices and Sporting Equipment Symposium, American Society of Mechanical Engineers, Columbus Ohio, 1986.

COMMITTEE AND ADMINISTRATIVE SERVICE

Orthopaedic Research Society

- Education Committee Member, 1998-2000 (Board, 2000)
- Program Committee (*ad hoc*), 1994, 2005, 2006
- Program Committee (*member*), 2002-2003
- Membership Committee (*member*) 2003-2007 (Board, 2006)
- Representative, Research Capitol Hill Day, 2005, 2006, Washington DC.

American Academy of Orthopaedic Surgery

- Committee on Bioengineering, 1996-1999

American Society of Biomechanics

- Executive Board, 1991-1993, 1995-1998, 2001-2004
- President-Elect, 2001-2002
- President, 2002-2003
- Past-President, 2003-2004
- Representative to Journal of Biomechanics
- Secretary-Treasurer, 1995-1998
- Nominating Committee, 1993-1994
- Program Chair, North American Congress on Biomechanics II, 1991-1993.

Orthopaedic Research and Education Fund

- Peer Review Committee for Grant Applications, 1998-2002.

National Institutes of Health

- *Ad hoc* reviewer, NIH Study Section, 2002, 2003, 2004
- Permanent member, NIH Study Section, "Skeletal Biology Structure and Regeneration 2004 – 2008
- *NIAMS Long range planning Panel*: September, 2004, invited participant
- Wear 2000 Workshop presented with the support of the American Academy of Orthopaedic Surgeons.
- Peer Review Child Development, 1993
- Peer Review Tissue Engineering, 1998
- Peer Review Minority Biomedical Research Support Program, 2002

World Council of Biomechanics – Member (2002-2014)

International Union of Theoretical and Applied Mechanics (IUTAM)

- member, Working Party Number 6, Biomechanics (2003-)

American Institute of Medical and Biological Engineering (AIMBE)

- representative for American Society of Biomechanics (1999-present)

PATENTS

Acetabular Cup Prosthesis with Extension For Deficient Acetabulum: Ramon b. Gustilo, M.D., **Joan E. Bechtold, Ph.D.**, Douglas Cooper, Marie Guion, MS., Richard S. Hammett, Patent No. 6,162,257, issued 2000.

Arthroplasty Trial Prosthesis Aligment Devices and Associated Methods: Ramon B. Gustilo, MD, Richard C. Hammett, William D.Lew, MS, **Joan E. Bechtold, PhD.**, Patent No. 5,733,292, issued 1998.

Implantable Limb Lengthening Nail Driven by Shape Memory Alloy: Michael Campbell, **Joan E. Bechtold, Ph.D.** and Arthur Erdman, Ph.D., Patent No. 5,415,660, issued 1995.

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ABSTRACTS

Elmengaard B, **Bechtold JE**, Baas J, Jakobsen T, Soballe, K: Fixation of allografted hydroxyapatite coated revision implants is improved by cracking the sclerotic bone rim, *Transactions*, 52nd Annual Meeting of the Orthopaedic Research Society, March, 2006.

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