

Smita Rao, PT, PhD

380 2nd Ave, 4th floor, New York, NY 10012
212 998 9194
smita.rao@nyu.edu

EDUCATION

- 2006 **Doctor of Philosophy**
Graduate Program in Physical Therapy and Rehabilitation Science
The University of Iowa
Thesis: Foot and Ankle Mechanics in Individuals with and without Diabetes Mellitus and Neuropathy
- 2000 **Master of Science, Orthopedic Physical Therapy**
University of Bombay (L.T.M. Medical College)
Thesis: Autonomic Dysfunction in Patients with Tension-type headache
- 1998 **Bachelor of Science, Physical Therapy**
University of Bombay (Seth G. S. Medical College)

ACADEMIC POSITIONS

- 2008-Present Assistant Professor, Department of Physical Therapy, Steinhardt School of Culture, Education and Human Development, New York University, New York, NY
- 2006-2008 Scholar-In-Residence, Center for Foot and Ankle Research, Department of Physical Therapy, Ithaca College – Rochester Center, Rochester, NY

FELLOWSHIPS AND GRANTS

- 2012-14 Rheumatology Scientist Development Award
- 2009 New York Physical Therapy Association Research Grant
- 2007-09 Post-Doctoral fellowship, Arthritis Foundation
- 2007 American Orthopedic Foot and Ankle Society Research Grant
- 2007 Chapter Grant, Upstate New York of the Arthritis Foundation
- 2005 University of Iowa Hospitals and Clinics General Clinical Research Center Research Award
- 2005 University of Iowa Student Government Research Grant
- 2004 American Academy of Cerebral Palsy and Developmental Medicine Travel Scholarship
- 2004 Alumni Scholarship, UI Graduate Program in Physical Therapy and Rehabilitation Science

AWARDS

- 2010 US Bone and Joint Decade Young Investigator Invitee
- 2009 Invited Poster, Annual Meeting, Orthopedic Research Society
- 2008 Best e-Poster Award, Annual Meeting, American Orthopedic Foot and Ankle Society
- 2006 *Honorable Mention*, Outstanding Graduate Student as Mentor Award, The University of Iowa, Iowa City, IA
- 2005 *Nominee*, Young Investigator Award, International Society of Biomechanics
- 2003, 2004 Whitaker Student Award, Gait and Clinical Movement Analysis Society
- 2003 Outstanding Teaching Assistant Award, The University of Iowa
- 2000 K.C. Mahindra Trust Scholarship for Post Graduate Studies in the US, Bombay, India
- 1998 Sir Dorab Tata Merit Scholarship, Bombay, India

SCHOLARSHIP

Refereed Journal Articles:

1. **Rao S**, Baumhauer J, Nawoczenski D. Is Barefoot Regional Plantar Loading Related To Self-Reported Foot Pain In Patients With Midfoot Osteoarthritis? (*Osteoarthritis and Cartilage*. 2011; 19 (8): 1019-25.
2. **Rao S**, Song J, Kraszewski A, Backus S, Ellis SJ, Deland JT, Hillstrom HJ. Foot Architecture Affects 1st Metatarsophalangeal Joint Function and Hallucal Loading. *Gait Posture*. 2011; 34 (1):131-7.
3. **Rao S**, Dietz F, Yack HJ. Estimates of Gastrocnemius Muscle Length during Simulated Pathological Gait (*Journal of Applied Biomechanics*, Accepted)
4. **Rao S**, Bell K. Is Metatarsus Primus Elevatus Independent of Arch Height? (*Journal of the Podiatric Medical Association*, Accepted)
5. **Rao S**, Dietz F, Yack HJ. Kinematics and Kinetics during Gait in Symptomatic and Asymptomatic Limbs of Children with Myelomeningocele. (*Journal of Pediatric Orthopedics*, Accepted)
6. Wilken J, **Rao S (corresponding author)**, Estin M, Saltzman CL, Yack HJ. A new device for assessing ankle dorsiflexion motion: reliability and validity. *The Journal of Orthopaedic and Sports Physical Therapy*. Apr 2011; 41(4):274-280.
7. Wilken J, **Rao S (corresponding author)**, Saltzman CL, Yack HJ. The Effect of Arch Height on Kinematic Coupling during Walking. *Clinical Biomechanics*. 2011; 26: 318–323.
8. **Rao S**, Ellis S, Deland J, Hillstrom HJ. (**Invited Review**) Nonmedicinal therapy in the management of ankle arthritis. *Current Opinion in Rheumatology*. 2010; 22(2): 223-228.
9. **Rao S**, Baumhauer J, Tome J, Nawoczenski D. Orthoses Alter *In Vivo* Segmental Foot Kinematics during Walking in Patients with Midfoot Arthritis. *Archives of Physical Medicine and Rehabilitation*. 2010; 91: 608-615.
10. **Rao S**, Saltzman CL, Yack HJ. The Relationship between Segmental Foot mobility and Loading in Individuals with and without Diabetes and Neuropathy. *Gait and Posture*. 2010; 31(2), 251-255.
11. Patel A, **Rao S**, Nawoczenski D, Baumhauer J. (**Invited Review**) Midfoot Arthritis. *Journal of the American Academy of Orthopaedic Surgeons*. 2010;18: 1-10
12. **Rao S**, Baumhauer JF, Tome J, Nawoczenski DA. Comparison of in vivo segmental foot motion during walking and step descent in patients with midfoot arthritis and matched asymptomatic control subjects. *Journal of Biomechanics*. 2009; 42:1054-1060.
13. **Rao S**, Baumhauer JF, Becica L, Nawoczenski DA. Shoe inserts alter plantar loading and function in patients with midfoot arthritis. *Journal of Orthopaedic & Sports Physical Therapy*. 2009; 39:522-531.
14. **Rao S**, Nawoczenski D, Baumhauer J. (**Invited Review**) Midfoot Arthritis: Nonoperative Options and Decision Making for Fusion *Techniques in Foot & Ankle Surgery*. September 2008; 73(3):188-95.

15. **Rao S**, Saltzman CL, Yack HJ. Segmental Foot Mobility in Individuals with and without Diabetes and Neuropathy *Clinical Biomechanics*. 2007; 22(4): 464-71.
16. **Rao S**, Yack HJ, Wilken JM, Saltzman CL. Increased Passive Ankle Stiffness and Reduced Dorsiflexion Range of Motion in Individuals with Diabetes Mellitus. *Foot and Ankle International*. 2006; 27(8):617-22.
17. **Rao S**, Saltzman CL, Yack HJ. Ankle ROM and stiffness measured at rest and during gait in individuals with and without diabetes and neuropathy. *Gait and Posture*. 2006; Nov; 24(3):295-301.
18. Janz KF, **Rao S**, Baumann HJ, Schultz JL. Measuring children's vertical ground reaction forces with accelerometry during walking, running, and jumping: The Iowa Bone Development Study. *Pediatric Exercise Science*. 2003; 15:34-43, 2003.

Refereed Journal Articles In Review:

19. **Rao S**, Carter S. Regional In-shoe Plantar Loading during Walking, Stair Ascent and Descent. (*Gait and Posture*, Accepted with Revisions)
20. **Rao S**, Baumhauer J, Nawoczenski D. Functional metatarsal length in patients with midfoot arthritis. (*Clinical Biomechanics*, In Review)
21. **Rao S**, Lo O. Magnitude and Symmetry of In-shoe Plantar Loading During Walking, Heel Raise and Sit-to-Stand Activities. (*Clinical Biomechanics*, In Review)
22. **Smita Rao**, Ji Hae Park, Cary Chapman, Steven Sheskie, Gina Civarra, Justin Weatherall, Kenneth Mroczek. Inter- and Intra-rater reliability of radiographic scales used to grade 1st Metatarsophalangeal Joint Osteoarthritis. (*Foot and Ankle International*, In Review)

Refereed Journal Articles In Preparation:

23. **Rao S**, Gross KD, Niu J, Nevitt M, Lewis B, Torner J, Hietpas J, Felson D, Hillstrom H. Are pressure time integral and cumulative plantar stress related to 1st metatarsophalangeal joint pain: The Multicenter Osteoarthritis Study. (*Arthritis and Rheumatism*, In Preparation)
24. **Rao S**, Baumhauer J, Nawoczenski D. *In vivo* kinematic effects of shoe inserts are task dependent. (*Physical Therapy*, In Preparation)
25. Riskowski J, **Rao S**, Hannan M. (*Invited Review, Best Practice & Research Clinical Rheumatology*, In Preparation)
26. **Rao S**, Baumhauer J, Nawoczenski D. *In vivo* multi-segment foot kinematics during a heel raise task in patients with midfoot arthritis. (*European Journal of Applied Physiology*, In Preparation)
27. **Rao S**, Saltzman, Yack, HJ. Plantar Fascia Thickness and First Metatarsal Mobility in Patients with Diabetes and Neuropathy. (*Clinical Orthopedics and Related Research*, In Preparation)
28. **Rao S**, Wilken J, Yack HJ. The Relationship Between Global Flexibility, Ankle Mobility, First Ray Mobility, Arch Height, and Plantar Pressures During Gait (*Journal of Athletic Training*, In Preparation)

29. **Rao S**, Ripa R, Bell K. The effect of footwear and task on lower extremity kinematics and kinetics. (*Gait and Posture*, In Preparation)
30. **Rao S**. Predictors of muscle activation strategy in women wearing high heeled shoes. (*Journal of Electromyography and Kinesiology*, In Preparation)
31. **Rao S**, Lightbourne K. Ankle, knee and hip predictors of walking speed in low- and high-heeled shoes. (*Journal of Electromyography and Kinesiology*, In Preparation)
32. **Rao S**, Doerner M. Segmental foot kinematics in high and low-heeled footwear. (*Footwear Science*, In Preparation)
33. **Rao S**, Lightbourne K. Predictors of the knee abduction moment during walking with high-heeled shoes. (*Journal of Electromyography and Kinesiology*, In Preparation)
34. **Rao S**, Patel M, Moffat M. First metatarsophalangeal joint kinematics and kinetics during barefoot and shod walking (*Journal of Foot and Ankle Research*, In Preparation)
35. Ahmed M, Gutierrez G, Memon N, Moffat M, **Rao S**. Use of a smartphone application to assess dynamic balance (*Age and Aging*, In Preparation)

Refereed Book Chapters:

1. Other Ankle Conditions. Rosalyn Nguyen, MD, Elizabeth Nguyen, MD, **Smita Rao, PT, PhD**. Comprehensive Therapeutic Programs for Musculoskeletal Disorders, edited by James Wyss, MD, MPT, and Amrish Patel, MD, PT (Volume Editors).
2. Non-surgical rehabilitation of First Metatarsophalangeal Sprain (Turf Toe) **Smita Rao, PT, PhD**, Kenneth Mroczek, MD, Steven Gould, MD, MPH. Orthopaedic Rehabilitation of the Athlete: Getting Back in the Game, edited by Bruce Reider, MD, Matthew T. Provencher, MD, George Davies, DPT, ATC, CSCS

Refereed Conference Proceedings and Presentations:

1. Are pressure time integral and cumulative plantar stress related to 1st metatarsophalangeal joint pain: The Multicenter Osteoarthritis Study. **Smita Rao**, K. Doug Gross, Jingbo Niu, Micheal Nevitt, James Torner, Cora Lewis, Jean Hietpas, David Felson, Howard Hillstrom. *2012 World Congress on Osteoarthritis (In Review), Barcelona, Spain 2012*
2. Foot Structure, Footwear and Foot Pain – Translating Evidence into Practice. **Smita Rao**, Marian Hannan, Howard Hillstrom. (Symposium) *American College of Rheumatology / Association of Rheumatology Health Professionals, Chicago, IL 2011*
3. Inter- and Intra-rater reliability of radiographic scales used to grade 1st Metatarsophalangeal Joint Osteoarthritis. **Smita Rao**, Ji Hae Park, Cary Chapman, Steven Sheskier, Gina Civarra, Justin Weatherall, Kenneth Mroczek. *2011 World Congress on Osteoarthritis, San Diego, CA 2011*
4. Gluteus Medius, Rectus Femoris, Peroneus Longus and Medial gastrocnemius Activation is Influenced by Footwear and Activity. **Smita Rao**, Renata Ripa. *International Society of Biomechanics, Brussels 2011*

5. Stress distribution in the 1st metatarsophalangeal joint for different foot types. Antoine Truchetet, Rajshree Mootanah, Howard Hillstrom, and **Smita Rao** *Advances and New Developments in Osteoarthritis, Anglia Ruskin University, Chelmsford, UK 2011*
6. Kinematic effects of foot orthoses are task dependent. **Smita Rao**, Judith F. Baumhauer, Deborah A. Nawoczenski. *International Society of Biomechanics, Brussels, Belgium 2011*
7. Reliability of Radiographic Grades Used to Assess 1st Metatarsophalangeal Joint Osteoarthritis. Ji Hae Park, Kenneth Mroczek, Cary Chapman, Steven Sheskier, Gina Civarra, Justin Weatherall, **Smita Rao**. *Summer Meeting, American Foot and Orthopedic Society, Denver, CO 2011*
8. Mechanisms Underlying Effectiveness of Foot Orthoses – A Translational Perspective. **Smita Rao**, Christopher Neville (**Symposium**) *American College of Sports Medicine, Denver CO 2011*
9. Reliability of Active Foot Range of Motion in Individuals with Midfoot Arthritis and Matched Controls. **Smita Rao**, Deborah Nawoczenski, Judith Baumhauer. (*Podium Presentation*) *2nd Congress of the International Foot and Ankle Biomechanics Community, Seattle, WA 2010*
10. Comparison of In-shoe Plantar Loading during Walking, Stair Ascent and Descent. **Smita Rao**, On-Yee Lo. *2nd Congress of the International Foot and Ankle Biomechanics Community, Seattle, WA 2010*
11. Foot Architecture Affects 1st Metatarsophalangeal Joint Function. **S. Rao**, J. Song, P. Demp, S. Backus, S. Ellis, J. Deland, A. Kraszewski, H. Hillstrom. *2nd Congress of the International Foot and Ankle Biomechanics Community, Seattle, WA 2010*
12. Symmetry of Plantar Pressure during Self-Selected Walking, fast Walking, Heel Raise and Sit-to-Stand Activities. **Smita Rao**, On-Yee Lo. *American Society of Biomechanics, Providence, RI 2010*
13. Effect of plication on gleno-humeral translation – a preliminary study. **S Rao**, A Miana, M Lenhoff, S Backus, B Vanadurongwan, N Chen, A Brown, S Coleman, F Cordasco, D Altchek, S Fealy, C Imhauser, A Karduna, R Warren, T Wright, R Zifchock, H Hillstrom. *American Society of Biomechanics, Providence, RI 2010*
14. The Validity of Using Smartphones as a Step Counter. **S Rao**, IK Saha, N Memon, U Topkara, AE Drik, G Gutierrez. *American Society of Biomechanics, Providence, RI 2010*
15. Reliability of Regional Plantar Pressure During Walking, Stair Ascent and Descent. **Smita Rao**, Sylvester Carter, On-Yee Lo. *American Society of Biomechanics, Providence, RI 2010*
16. In-shoe Plantar Loading During Walking, Heel Raise and Sit-to-Stand Activities. **Smita Rao**, On-Yee Lo. *Annual Meeting of the New York Physical Therapy Association, Atlantic City, NJ 2010*
17. Principal Components Analysis to Assess Plantar Loading in Patients with Midfoot Arthritis and Matched Control Subjects. **Smita Rao**, Yen Wei Chen, Judith F. Baumhauer, Deborah A. Nawoczenski, Howard J. Hillstrom. *Joint meeting of the Gait and Clinical Movement Analysis Society and the European Society of Movement Analysis in Adults and Children, Miami, FL 2010*

18. Comparison of In-shoe Plantar Loading During Walking, Heel Raise and Sit-to-Stand Activities. **Smita Rao**, On-Yee Lo. *Joint meeting of the Gait and Clinical Movement Analysis Society and the European Society of Movement Analysis in Adults and Children, Miami, FL 2010*
19. Functional metatarsal length in patients with midfoot arthritis. **Smita Rao**, Judith F. Baumhauer, Deborah A. Nawoczenski. (**Podium Presentation**) *Joint meeting of the Gait and Clinical Movement Analysis Society and the European Society of Movement Analysis in Adults and Children, Miami, FL 2010*
20. How do Orthotic/Bracing Interventions Really Work? Deborah Nawoczenski, **Smita Rao**, Christopher Neville, Jeff Houck (**Instructional Course**) *Combined Sections Meeting, American Physical Therapy Association, San Diego, CA 2010*
21. Comparison of in vivo multi-segment foot kinematics during a heel raise task in patients with midfoot arthritis and matched control subjects. **Smita Rao**, Judith F. Baumhauer, Deborah A. Nawoczenski. *Combined Sections Meeting, American Physical Therapy Association, San Diego, CA 2010*
22. A Novel Method to Delineate Shoulder Kinematics – Reliability and Validity. **Smita Rao** Andreia Miana, Mark Lenhoff, Howard Hillstrom *Annual Meeting, American Society of Biomechanics, State College, PA 2009*
23. Barefoot plantar loading in patients with midfoot arthritis during walking. **Smita Rao**, Judith Baumhauer, Deborah Nawoczenski *Annual Meeting of the European Society of Movement Analysis for Adults and Children, London, UK 2009*
24. Improvements in foot function following non-operative treatment in patients with midfoot arthritis – 4 week and 6 month follow up. **Smita Rao**, Judith Baumhauer, Deborah Nawoczenski (**Best e-Poster Award**) *Summer Meeting, American Foot and Orthopedic Society, Vancouver, Canada 2009*
25. Shoe inserts alter in vivo segmental motion in patients with midfoot arthritis. **Smita Rao**, Judith Baumhauer, Deborah Nawoczenski. (**Invited Poster**) *Orthopedic Research Society, Las Vegas, NV 2009*
26. Understanding functional movements in patients with arthritis - quantitative strategies to examine the motor performance at hip, knee and foot. Doreen Stiskal, **Smita Rao** (Study Group) *American College of Rheumatology, Philadelphia, PA 2009*
27. Factors contributing to Impairments in Self-Reported Outcomes in Patients with Midfoot Arthritis. **Smita Rao**, Judith Baumhauer, Deborah Nawoczenski. *American College of Rheumatology, San Francisco, CA 2008*
28. Shoe inserts alter *in vivo* segmental motion in patients with midfoot arthritis. **Smita Rao**, Judith Baumhauer, Deborah Nawoczenski. (**Best e-Poster Award**) *Summer Meeting, American Foot and Orthopedic Society, Denver, CO 2008*
29. Optimizing Conservative Intervention for Patients with Midfoot Arthritis: Treatment Choices, Effects and Implications for Clinical Decision Making. **Smita Rao**, Deborah Nawoczenski, Jeffrey Houck. (**Instructional Course**) *Pedorthic Footwear Association Meeting, Nashville, TN 2008*
30. Comparison of In Vivo Segmental Foot Mobility during Walking and Step Descent in Patients with Midfoot Arthritis. **Smita Rao**, Judith Baumhauer, Josh Tome, Deborah Nawoczenski. *1st International Foot and Ankle Biomechanics Congress, Bologna, IT 2008*

31. Plantar Fascia Thickness and First Metatarsal Mobility in Patients with Diabetes and Neuropathy **Smita Rao**, Charles Saltzman, H. John Yack *1st International Foot and Ankle Biomechanics Congress, Bologna, IT 2008*
32. Comparison of In Vivo Segmental Foot Mobility during Walking and Step Descent in Patients with Midfoot Arthritis. **Smita Rao**, Judith Baumhauer, Josh Tome, Deborah Nawoczenski. *1st International Foot and Ankle Biomechanics Congress, Bologna, IT 2008*
33. The Effect of Foot Orthoses on Three-Dimensional Segmental Kinematics of the Foot in Patients with Midfoot Arthritis. **Smita Rao**, Laura Becica, Judith Baumhauer, Deborah Nawoczenski (**Podium Presentation**) *Annual Meeting, Gait and Clinical Movement Analysis Society, Richmond VA 2008*
34. Uncovering Mechanisms underlying the Effectiveness of Shoe Inserts in Patients with Midfoot Arthritis (**Podium Presentation**) **Smita Rao**, Laura Becica, Judith Baumhauer, Deborah Nawoczenski *Combined Sections Meeting, American Physical Therapy Association, Nashville, TN 2008*
35. Uncovering the effects of shoe inserts on plantar loading in patients with midfoot arthritis. (Podium Presentation) **Smita Rao**, Deborah Nawoczenski, Judith Baumhauer *Summer Meeting, American Foot and Orthopedic Society, Toronto, Canada 2007*
36. The Relationship between Segmental Foot mobility and Loading in Individuals with and without Diabetes and Neuropathy. **Smita Rao**, Charles Saltzman, H. John Yack *Combined Sections Meeting, American Physical Therapy Association, Boston, MA 2007*
37. Understanding Foot Structure and Function: the Relationship between First Ray and Ankle Stiffness and Plantar Pressures during Gait. **Smita Rao**, Andrew Arthur, Brooke Fancher, Leah Hentges, Jennifer Massman, Andrea Vierling, H. John Yack *Combined Sections Meeting, American Physical Therapy Association, Boston, MA 2007*
38. Segmental Foot Mobility in Individuals with and without Diabetes and Neuropathy. **Smita Rao**, Charles Saltzman, H. John Yack *Annual Meeting, American Society of Biomechanics, Blacksburg, VA 2006*
39. Changes in mechanical characteristics of the plantar flexors in individuals with diabetes mellitus. **Smita Rao**, Jason Wilken, Charles Saltzman, H. John Yack. (**Nominated for Young Investigator Award**) *Annual Meeting, International Society of Biomechanics, Cleveland, OH 2005*
40. Comparison of Plantar Loading, Ankle Range of Motion and Ankle Stiffness in Individuals with and without Diabetic Neuropathy **Smita Rao**, Charles Saltzman, H. John Yack. (**Podium Presentation**) *Combined Sections Meeting, American Physical Therapy Association, New Orleans, LA, 2005*
41. Ankle kinetics, kinematics and stiffness in normal children simulating pathological gait patterns. **Smita Rao**, H. John Yack. (**AACPDM Travel Award**) *Annual Meeting, American Academy of Cerebral Palsy and Developmental Medicine, Los Angeles, CA, 2004*
42. Plantar Loading, Ankle Range of Motion and Ankle Stiffness in Individuals with and without Diabetic Neuropathy. **Smita Rao**, Charles Saltzman, H. John Yack. *Summer Meeting, Academy of Orthopedic Foot and Ankle Surgeons, Seattle, WA 2004*

43. Plantar Loading, Ankle Range of Motion and Ankle Stiffness in Individuals with Diabetic Neuropathy. **Smita Rao**, Charles Saltzman, H. John Yack. (**Whitaker award**) *Annual Meeting, Gait and Clinical Movement Analysis Society, Lexington, KY 2004*
44. Kinematics and Kinetics in Symptomatic and Asymptomatic Knees of Children with Myelomeningocele. **Smita Rao**, H. John Yack, Frederick Dietz. (**Whitaker award**) *Annual Meeting, Gait and Clinical Movement Analysis Society, Wilmington, DE 2003*
45. Effect of Prosthetic Foot-type and Walking Velocity on Vertical Ground Reaction Forces in Individuals with Transtibial Amputations. **Smita Rao**, H. John Yack, Miao-Ju Hsu, Ruchika Chandran, David Nielsen. (**Podium Presentation**) *Annual Meeting, Gait and Clinical Movement Analysis Society, Chattanooga, TN, 2002*
46. The Effects of Varying Stride Frequency on Ground Reaction Forces in Recreational Runners. Benjamin Jobgen, Christopher Kipp, Perry Rich, Eric Turner, **Smita Rao**, H. John Yack. *Combined Sections Meeting, American Physical Therapy Association, San Antonio, TX, 2001*

Non-Refereed Invited Presentations:

- Radiology Research Meeting, New York University -Hospital for Joint Diseases. October 2011
- New York University Medical Center Rehabilitation Network; Running Symposium: A Multidisciplinary Approach to Treating the Runner Across Age, Gender, and Injury. Invited Speaker and Expert Panelist. September 2011
- K.J. Somaiya College of Physiotherapy, Maharashtra University of Health Sciences, India. January 2011
- Ramakrishna Mission Vidyalaya, Coimbatore, India. January 2011
- Sir Hurkison Nurrotumdas Hospital and Research Centre, Mumbai, India. January 2011
- Minimally Invasive Surgery Lab, Department of Orthopaedic Surgery, New York University School of Medicine, NY. September 2010
- Biomechanics Lab, Department of Orthopaedic Surgery, Hospital for Special Surgery, NY. July 2010
- Glasgow Caledonian University, Glasgow, UK. September 2009
- Foot Biomechanics Boot Camp, Melbourne, Australia. December 2007
- Royal Children's Hospital, Melbourne, Australia. December 2007
- "A Matter of Balance", Community Based Fall Prevention Program, St John's Meadows senior living community, Rochester, NY. March 2007
- "Best Foot Forward: Foot Health across the Lifespan", Gerontology Institute, Ithaca, NY. April 2007
- Anatomy Seminar Series, Department of Anatomy, the University of Iowa, IA. June 2005

GRANTS

Ongoing:

Pain Sensitization in 1st Metatarsophalangeal Osteoarthritis **07/2012-06/2014**
\$ 125,000.00 ACR/ARHP REF Rheumatology Scientist Development Award
This project evaluates pain sensitization and plantar loading in patients with 1st MTP OA.
Mentors: Howard Hillstrom, PhD, Marian Hannan, DSc, MPH.

Optimizing outcomes in patients with venous ulcer: a randomized clinical trial **06/09-06/11**
\$ 6000.00 New York Physical Therapy Association
This project seeks to assess whether rocker sole shoes can enhance self-reported outcomes and ulcer healing in patients with chronic venous ulcers.

Co-PIs: Louis Iannuzzi, DPT, Miguel Sanchez, MD.

Tibiofemoral kinematics after ACL reconstruction

09/2010-08/2012

\$ 100,000 (\$ 15,500 Subcontract)

Private Foundation

This project combines 3D gait analysis and MRI-based models to assess knee function. It is conducted in collaboration with Peter Walker, PhD, Orrin Sherman, MD, and Laith Jazrawi, MD at the Department of Orthopedic Surgery, NYU SOM.

Pending / In Review:

Clinical and MRI-based determinants of foot pain and physical function in 1st MTP osteoarthritis

\$ 20,000.00

Research award, AOFAS

This project examines cartilage thickness and volume as predictors of pain in 1st MTP OA.

Co-I: Cary Chapman, MD, Ravinder Regatte, PhD

Effect of Soft Tissue Mobilization on Pain Sensitization in 1st Metatarsophalangeal Joint Osteoarthritis

\$ 15,000.00

Orthopedic Section, APTA

This project assesses whether soft tissue mobilization reduces pain sensitization and restores plantar loading in patients with 1st MTP OA.

Co-I: Kenneth Mroczek, MD,

Mechanical and biochemical determinants of foot pain in 1st MTP OA

07/2013-06/2015

\$ 100,000.00

Arthritis Foundation Young Investigator Award Resubmission

This translational project assesses the role of biomechanical (joint motion, loading) and (cartilage degradation, gene expression) in patients with 1st MTP joint arthritis.

Co-I: Kenneth Mroczek, MD, Chuanju Liu, PhD

Completed:

Inter-ACTT: Interactive Strategies Targeting Physical Activity through Technology

06/09-08/10

\$ 20,000.00

Steinhardt Faculty Challenge technology Award, Summer Development Award

The goal of this project is to develop and integrate the use of accelerometry-based smartphones to track physical activity and fall risk in aging adults. This project is a collaborative effort between Smita Rao and Nasir Memon, PhD at Polytechnic Institute of New York University.

Optimizing Functional outcomes in Individuals with Midfoot Arthritis

07/07-07/09

\$ 120,000.00

Arthritis Foundation, American Orthopedic Foot and Ankle Society Research Award

The purpose of this study was to examine changes in midfoot motion, and its relationship to functional outcomes in patients with midfoot arthritis, treated with orthoses. This award provided salary support for Smita Rao (PI), and research support for the project, with supervision by mentors Deborah A. Nawoczenski, PT, PhD and Judith F. Baumhauer.

Biophysical Determinants of Diabetic Foot Ulcer healing

09/00-10/05

NIH R01 NR07721-04, University of Iowa Hospitals and Clinics General Clinical Research Center Research Grant, University of Iowa Student Government Research Grant

The goal of this project was to assess the role of foot and ankle mechanics in contributing to ulcer development in at-risk feet. Mentored by Charles Saltzman, MD (PI) and H. John Yack, PhD, PT, Smita Rao served as a Research Assistant, and subsequently as a PI on this project.

Hormonal Fluctuations And The Potential For Injury In The Female Athlete

09/03-09/06

Organon Inc (H. John Yack: PI)

The goal of this project was to assess the role of hormonal factors in contributing to variations in knee kinematics and kinetics in women. Smita Rao served as Project Coordinator.

Kinematics and Kinetics of the Knee during Gait in Children with Myelomeningocele

06/02-05/04

Childrens Miracle Network (H. John Yack: PI)

The purpose of this study was to identify abnormal patterns of knee motion and loading in children with myelomeningocele, with the long term objective of preventing early knee arthritis. Smita Rao served as a Research Assistant.

Effect of Prosthetic Foot-type in Individuals with Transtibial Amputations

06/00-06/02

Ossur Inc., Ottobock Inc. (David Nielsen: PI, H. John Yack: co-PI)

The purpose of this project was to identify optimal design features of prothetic feet to minimize impact forces and metabolic cost in individuals with transtibial amputations. Smita Rao served as a Research Assistant.

The Iowa Bone Development Study

01/01-06/01

NIH R01 DE12101 & DE09551, The University of Iowa Oberman Center for
Advanced Studies CASSPR Program (Kathleen Janz: PI)

The purpose of this study was to assess ground reaction force, physical activity and bone density in children. Smita Rao served as a Research Assistant.

TEACHING:

New York University (2008-present)

Doctor of Physical Therapy program

- Kinesiology/Biomechanics/Ergonomics (5 sh)
- Physical Agents and Mechanical Modalities (Includes Aseptic Techniques/Infection Control)(4 sh)
- Manual Techniques (3 sh)
- Physical Therapy Examination of the Musculoskeletal System (4 sh)
- Physical Therapy Interventions /Prevention /Wellness Programs for the Musculoskeletal System (4 sh)

M.A. (specialization in Pathokinesiology)/Ph.D. programs

- Measurement and Evaluation in Human Motion (3 sh)

Clinical Residency in Orthopedic Physical Therapy program

- Didactic Lectures (Foot and Ankle anatomy, 2011; Pain, Inflammation and Repair, 2010, 2011)
- Weekend Intensives (Foot and Ankle Module, 2010, 2012; Gait Analysis Module, 2011)

Ithaca College (2006-2008)

Doctor of Physical Therapy program(Sabbatical Replacement)

- Pathokinesiology (3 sh)
- Prosthetics and Orthotics (3 sh)
- Research Seminar III (3 sh)

The University of Iowa (2000-2006):

Doctor of Physical Therapy program (Graduate Teaching Assistant)

- Kinesiology and Pathomechanics (4 sh)
- Case based Learning (1 sh)
- Physical Agents in Rehabilitation (2 sh)
- Pediatric Elective in Physical Therapy (1 sh)
- Musculoskeletal Therapeutics (3 sh)

M.A. /Ph.D. programs (Graduate Teaching Assistant)

- Biomechanics in Rehabilitation (3 sh)
- Biomedical Instrumentation (3 sh)

Health Promotion Specializations (Graduate Teaching Assistant)

- Practicum in Health Promotion(1 sh)

MENTORING (MA / PhD students, 2nd Year MPT / DPT Students):

New York University

PhD Students

- On-Yee Lo, MA (2008-2010)
- Yen Wei Chen, MA (2008- present)
- Sylvester Carter, PT, MHS (2008-present)

MA Students

- Renata Ripa, MA (2010)
- Manthan Patel , PT (2010)
- Mohamed Ahmed, PT (2010)

MS Students

- Haowen Ning, MS (2010)
- Indrani Kundu Saha, MS (2009)

Medical Students

- Tiffany Zachos, DVM, PhD (2010)
- Deep Parikh, BS (2011)

Ithaca College

DPT Students (Research Mentor)

- 2008 Lindsay Drader, Michael Pro, Tyler Thurston, Stacey Rivet, Catherine Ebert (*DPT students*)
- 2007 Ashley Fox, Michele Tolpa, Kasey , Ryan Holm, Alison Helmetsie, Anna Dube (*DPT students*)

The University of Iowa

DPT Students (Research Mentor)

- 2005-2006 Christine Fletcher, Cory McCall, Katie vanArendonk, Jill Pedretti (*DPT students*)

- 2004-2005 Andrew Arthur, Brooke Fancher, Leah Hentges, Andrea Vierling (*DPT students*)
- 2003-2004 Tristan Boaldin, Jeffery Fleming, Alisa Schons, Nicole Summerlin (*DPT students*)
- 2002-2003 Kelli Brown, Kelly Ealy, Colleen Hurd, Paula Siems, Holly Zieske (*MPT students*)
- 2001-2002 John Eikenberry, Sara James, Jill Prater, Bounvilay Thongsoum (*MPT students*)
- 2000-2001 Benjamin Jobgen, Christopher Kipp, Perry Rich, Eric Turner (*MPT students*)

SERVICE AND CLINICAL EXPERIENCE:

Professional Service:

Reviewer for Scientific Peer Reviewed Journals

- Archives of Physical Medicine and Rehabilitation (2008-present)
- Biomedizinische Technik (2008-present)
- Clinical Biomechanics (2008-present)
- Gait and Posture (2008-present)
- IEEE Transactions in Biomedical Engineering (2008-present)
- Human Movement Science (2008-present)
- Journal of Foot and Ankle Research (2008-present)
- Journal of Biomechanics (2008-present)
- Journal of Orthopedic and Sports Physical Therapy (2011)
- Osteoarthritis and Cartilage (2011)
- Physical Therapy (2011)

Textbook Reviewer

- Physical Therapy Skills by Mark Dutton (2010)
- Kinesiology: The Mechanics and Pathomechanics of Human Movement by Carol Oatis (2011)

Invited Reviews

- Invited as independent commentator for Medscape Medical News, February 28, 2011
- Stem Cell Therapy in Neurological Disorders, Alok Sharma, MS, MCh, Nandini Gokulchandran, MD. ISBN: 81 86876 06 5. Published in the Journal of Special Education and Disability Management, 2011

Program Committee and/or Session Chair

- Gait and Clinical Movement Analysis Society 2012 (Program committee)
- 2nd Congress of the International Foot and Ankle Biomechanics Community 2010 (Program committee and Session co-Chair)
- Gait and Clinical Movement Analysis Society 2011 (Program committee)
- American College of Sports Medicine, Denver 2011 (Session Chair)

Memberships in Professional Societies

- Indian Association of Physiotherapists (1998-present)
- American Physical Therapy Association (2004-present)
- Association of Rheumatology Health Professionals (2008-present)
- American College of Sports Medicine (2010-2011)
- Gait and Clinical Movement Analysis Society (2003-present)
- American Society of Biomechanics (2006-present)
- International Society of Biomechanics (2010-present)

Service to Departmental, School and University:

- Department of Physical Therapy, Curriculum Committee (2008-present)
- Department of Physical Therapy, Technology Committee (2008-present)
- NYU-Steinhardt Challenge Grant Review (2010, 2011)
- NYU-Steinhardt PhD in Rehabilitation Science Working Group (2011-present)
- NYU-Steinhardt-Rusk Collaborative Research Group (2010-present)

Clinical Service and Licensure:

- Licensed Physical Therapist (India: 1998-present, New York: 2004-present, Iowa: 2005-2007)
- Patanjali Yoga Instructor (1996)
- Power Pilates Beginner Mat Training Certification (2011)
- Continuing Education courses presented/organized:
 - “The Foot in Diabetes: A biomechanical perspective” Iowa Physical Therapy Association South East District, Iowa City, IA. November 2004
 - Combined Sections Meeting, San Diego, 2010.
 - New York University Running Symposium, 2011
 - New York University Orthopedic Residency Foot and Ankle Weekend Module, 2010, 2012; Gait Module, 2011.
- Clinical Gait Analysis:
 - Pediatric Population: Normative database, Children with Cerebral Palsy, Children with Spina Bifida
 - Adult Population: Individuals with trans-tibial and/or trans-femoral amputation

Continuing Education:

- American College of Rheumatology/Association of Rheumatology Health Professionals, Chicago, IL 2011
- International Society of Biomechanics, Brussels, Belgium 2011
- American College of Sports Medicine, Denver, CO 2011
- Combined Sections Meeting, American Physical Therapy Association, New Orleans, LA 2011
- US Bone and Joint Decade Young Investigators Initiative Workshop, Chicago, IL 2010
- Annual Meeting, American Society of Biomechanics, Providence, RI 2010
- 2nd Congress of the International Foot and Ankle Biomechanics Community, Seattle, WA 2010
- Joint Meeting of the ESMAC and GCMAS, Miami, FL 2010
- Combined Sections Meeting, American Physical Therapy Association, San Diego, CA 2010
- European Society of Movement Analysis for Adults and Children, London, UK 2009
- Orthopedic Research Society, Grant Writing Workshop, 2009
- American College of Rheumatology / Association of Rheumatology Health Professionals, Philadelphia, PA 2009
- 1st International Foot and Ankle Biomechanics Congress, Bologna, IT 2008
- Gait and Clinical Movement Analysis Society, Richmond VA 2008
- Combined Sections Meeting, American Physical Therapy Association, Nashville, TN 2008
- NIH Grant Writing Workshop: ERRIS, 2007
- Foot Biomechanics Boot Camp, La Trobe University, Melbourne, 2007
- American Foot and Orthopedic Society, Toronto, Canada 2007
- Combined Sections Meeting, American Physical Therapy Association, Boston, MA 2007
- American Society of Biomechanics, Blacksburg, VA 2006
- International Society of Biomechanics, Cleveland, OH 2005
- Combined Sections Meeting, American Physical Therapy Association, 2005

