

EDUCATION

- 2006** **Doctor of Philosophy**
Graduate Program in Physical Therapy and Rehabilitation Science,
The University of Iowa, IA
- 2000** **Master of Science, Orthopedic Physical Therapy**
University of Bombay, India
- 1998** **Bachelor of Science, Physical Therapy**
University of Bombay, India

LICENSURE

Physical Therapist

- India (1998-present)
- New York (2004-present)
- Iowa (2005-2007)

ACADEMIC POSITIONS

- 2014-present** **Associate Professor with Tenure**
2008-2014 **Assistant Professor**
Department of Physical Therapy,
Steinhardt School of Culture, Education and Human Development
New York University
- 2015–present** **Research Associate Professor**
2012-2015 **Research Assistant Professor**
Department of Orthopedic Surgery,
New York University School of Medicine
- 2009-present** **Visiting Scientist**
Leon Root, MD, Motion Analysis Laboratory,
Hospital for Special Surgery
- 2006-2008** **Scholar-In-Residence, Ithaca College**
Center for Foot and Ankle Research,
Department of Physical Therapy,
Ithaca College – Rochester Center

HONORS AND AWARDS

- Griffith's Research Award, NYU Steinhardt, 2016
- NYU CTSI Pilot TDEAs (Translational, Developmental, Exploratory Awards), 2012-2013
- Rheumatology Scientist Development Award, Rheumatology Research Foundation, 2012-2014
- Best e-Poster Award, Annual Meeting, American Orthopedic Foot and Ankle Society, 2008
- Post-Doctoral Fellowship, Arthritis Foundation, 2007-2009

- Honorable Mention, Outstanding Graduate Student as Mentor Award, The University of Iowa, Iowa City, IA, 2006
- Nominee, Young Investigator Award, International Society of Biomechanics, 2005
- University of Iowa Hospitals and Clinics, Clinical Research Center Research Award, 2005
- Whitaker Student Award, Gait and Clinical Movement Analysis Society, 2003, 2004
- Outstanding Teaching Assistant Award, The University of Iowa, 2003
- K.C. Mahindra Trust Scholarship for Post Graduate Studies in the US, Bombay, India, 2000
- Sir Dorab Tata Merit Scholarship, Bombay, India, 1998

SCHOLARSHIP

REFEREED JOURNAL ARTICLES:

1. **Rao, S.**, Gross, K.D., Niu, J., Nevitt, M., Torner, M., Lewis, C., Hietpas, J., Felson, D.T., Hillstrom, H.J. Are pressure time integral and cumulative plantar stress related to 1st metatarsophalangeal joint pain: The Multicenter Osteoarthritis Study. *Arthritis Care & Research*. (Published online ahead of print December 29, 2015 doi: 10.1002/acr.22826)
2. Kevern, M., Beecher, M., and **Rao, S.** (2014). Reliability of Measurement of Glenohumeral Internal Rotation, External Rotation, and Total Arc of Motion in Three Different Test Positions. *Journal of Athletic Training*; 49(5):640-6.
3. **Rao, S.**, Bell, K. (2013). Is Metatarsus Primus Elevatus Independent of Arch Height? *Journal of the Podiatric Medical Association*, 103(5):347-54.
4. **Rao, S.**, Ripa, R., Lightbourne, K. (2013). Predictors of walking speed and stride length in high- and low-heeled footwear. *Footwear Science*, 5(3): 179-84.
5. **Rao, S.**, Dietz, F., Yack, H.J. (2013). Estimates of Gastrocnemius Muscle Length during Simulated Pathological Gait. *Journal of Applied Biomechanics*, 29 (2): 127-34.
6. **Rao, S.** (2013). Quantifying foot function in individuals with rheumatoid arthritis – recent advances and clinical implications. **Invited Editorial**, *Arthritis Care & Research*, 65(4): 493-4.
7. **Rao, S.**, Riskowski, J., Hannan, M. (2012). Musculoskeletal conditions of the foot and ankle: Assessments and treatment options. **Invited Review**, *Best Practice & Research Clinical Rheumatology*, 26(3):345-68.
8. **Rao, S.**, Carter, S. (2012). Regional In-shoe Plantar Loading during Walking, Stair Ascent and Descent. *Gait and Posture*, 36(2):265-70.
9. **Rao, S.**, Dietz, F., Yack, H.J. (2012). Kinematics and Kinetics during Gait in Symptomatic and Asymptomatic Limbs of Children with Myelomeningocele. *Journal of Pediatric Orthopedics*, 32 (1): 106–112.

10. **Rao, S.**, Baumhauer, J.F., Nawoczenski, D. A. (2011). Is Barefoot Regional Plantar Loading Related To Self-Reported Foot Pain In Patients With Midfoot Osteoarthritis? *Osteoarthritis and Cartilage*, 19 (8): 1019-25.
11. **Rao, S.**, Song, J., Kraszewski, A., Backus, S., Ellis, S.J., Deland, J.T., Hillstrom, H.J. (2011). Foot Architecture Affects 1st Metatarsophalangeal Joint Function and Hallucal Loading. *Gait Posture*, 34 (1):131-7.
12. Wilken, J.M., **Rao, S.**, Estin, M., Saltzman, C.L., Yack, H.J. (2011). The Effect of Arch Height on Kinematic Coupling during Walking. *Clinical Biomechanics*, 26: 318–323.
13. Wilken, J., **Rao, S.**, Estin, M., Saltzman, C.L., Yack, H.J. (2011). A new device for assessing ankle dorsiflexion motion: reliability and validity. *Journal of Orthopaedic and Sports Physical Therapy*, 41(4):274-280.
14. **Rao, S.**, Ellis, S.J., Deland ,J.T., Hillstrom, H.J. (2010). Nonmedicinal therapy in the management of ankle arthritis. **Invited Review**. *Current Opinion in Rheumatology*, 22(2): 223-228.
15. **Rao, S.**, Baumhauer, J.F., Tome J., Nawoczenski D.A. (2010). Orthoses Alter In Vivo Segmental Foot Kinematics during Walking in Patients with Midfoot Arthritis. *Archives of Physical Medicine and Rehabilitation*, 91: 608-615.
16. **Rao, S.**, Saltzman, C.L., Yack, H.J. (2010). The Relationship between Segmental Foot mobility and Loading in Individuals with and without Diabetes and Neuropathy. *Gait and Posture*, 31(2), 251-255.
17. Patel, A., **Rao, S.**, Nawoczenski, D.A., Baumhauer, J. F. (2010). Midfoot Arthritis. **(Invited Review)** *Journal of the American Academy of Orthopaedic Surgeons*,18: 1-10.
18. **Rao, S.**, Baumhauer, J.F., Tome J., Nawoczenski D.A. (2009). 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*, 42:1054-1060.
19. **Rao, S.**, Baumhauer, J.F., Becica, L., Nawoczenski D.A. (2009). Shoe inserts alter plantar loading and function in patients with midfoot arthritis. *Journal of Orthopaedic & Sports Physical Therapy*. 39:522-531.
20. **Rao, S.**, Nawoczenski D.A., Baumhauer, J.F. (2008). Midfoot Arthritis: Nonoperative Options and Decision Making for Fusion. **(Invited Review)** *Techniques in Foot & Ankle Surgery*, 73(3):188-95.
21. **Rao, S.**, Saltzman, C.L., Yack, H.J. (2007). Segmental Foot Mobility in Individuals with and without Diabetes and Neuropathy. *Clinical Biomechanics*, 22(4): 464-71.
22. **Rao, S.**, Yack, H.J., Wilken, J.M., Saltzman, C.L. (2006). Increased Passive Ankle Stiffness and Reduced Dorsiflexion Range of Motion in Individuals with Diabetes Mellitus. *Foot and Ankle International*, 27(8):617-22.
23. **Rao, S.**, Saltzman, C.L., Yack, H.J. (2006). Ankle ROM and stiffness measured at rest and during gait in individuals with and without diabetes and neuropathy. *Gait and Posture*, 24(3):295-301.

24. Janz K.F., **Rao, S.**, Baumann, H.J., Schultz, J.L. (2003). Measuring children's vertical ground reaction forces with accelerometry during walking, running, and jumping: The Iowa Bone Development Study. *Pediatric Exercise Science*, 15:34-43, 2003.

REFEREED JOURNAL ARTICLES IN REVIEW:

Rao, S., Khan, H., Jazrawi, L., Alaia, M., Garofolo, G., Bansal, B., Nayyar, S., Sherman, O., Walker, P. In Vivo Knee Function in individuals after anterior cruciate ligament reconstruction with bone-patellar tendon-bone autograft – comparison of medial versus transtibial femoral tunnel placement. Submitted to *Clinical Orthopedics and Related Research*.

Rao, S., Parker, H., Mroczek, K., Krebs, P. Feasibility of mobile health applications in individuals with diabetes and foot complications. Submitted to *The Journal of Diabetes Science and Technology*.

Rao, S., Park, J.H., Chapman, C., Sheskier, S., Ciavarra, G., Weatherall, J., Mroczek, K. Inter- and Intra-rater reliability of radiographic scales used to grade 1st Metatarsophalangeal Joint Osteoarthritis. Submitted to *Orthopedics*.

Rao, S., Lo, O. Magnitude and Symmetry of In-shoe Plantar Loading During Walking, Heel Raise and Sit-to-Stand Activities. Submitted to *Clinical Biomechanics*.

Rao, S., Baumhauer, J.F., Nawoczenski, D.A. Functional metatarsal length in patients with midfoot arthritis. Submitted to *Clinical Biomechanics*.

Rao, S., Doerner, M., Ripa, R. Segmental foot kinematics in high and low-heeled footwear. Submitted to *Gait and Posture*.

REFEREED BOOK CHAPTERS:

1. **Rao, S.**, Mroczek, K. (2014) Non-surgical rehabilitation of First Metatarsophalangeal Sprain (Turf Toe). In B. Reider, M. T. Provencher, & G. Davies (Eds.), *Orthopaedic Rehabilitation of the Athlete: Getting Back in the Game*.: Elsevier.
2. Nguyen, R., Nguyen, E., & **Rao, S.** (2012). Other Ankle Conditions. In J. Wyss & A. Patel (Eds.), *Comprehensive Therapeutic Programs for Musculoskeletal Disorders*.: Demos Medical.
3. Joshi, R., Song, J., Mootanah, R., **Rao, S.**, Backus, S., Hillstrom, H.J. (2012) Structure and Function of the Foot. In D. Altcheck, C. Digiovanni, J. Dines, & R. Positano (Eds.), *Foot and Ankle Sports Medicine*.: Lippincott Williams & Wilkins.
4. Song, J., Joshi, R., Mootanah, R., **Rao, S.**, Kraszewski, A., Backus, S., Hillstrom, H.J. (2012) Plantar Pressure Measurement of the Athlete. In D. Altcheck, C. Digiovanni, J. Dines, & R. Positano (Eds.), *Foot and Ankle Sports Medicine*.: Lippincott Williams & Wilkins.

REFEREED CONFERENCE PRESENTATIONS (Organized by Research Role):

As Principal Investigator (indicates Graduate Student, Resident or Mentee)*

1. Chimenti, R., DiLiberto, F., Hastings, M.K., Neville, C., **Rao, S.** (2016) The Neglected Midfoot: New Research Guiding Clinical Examination and Intervention. Instructional Course, Combined Sections Meeting, American Physical Therapy Association, Anaheim, CA.
2. *Richmond, D., Castro, K. Medeiros da Costa Dias, T., Marinho de Lima Filho, N., Meer, J., **Rao, S.** (2016) Development of a Rating Scale for Video Analysis of Yoga Poses. Podium Presentation at the Combined Sections Meeting, American Physical Therapy Association, Anaheim, CA.
3. *Burr, J., Boland, M., Aldrien, E., Baumstein, R., Trivedi, K., **Rao, S.** (2016) Body Mass Index predicts Palmar Force sustained during Yoga Poses. Poster Presentation at the Combined Sections Meeting, American Physical Therapy Association, Anaheim, CA.
4. *Klifton, C., Sapienza, A., Posner, M., **Rao, S.** (2015) Wrist Biomechanics during Yoga. Podium Presentation at the American Society for Surgery of the Hand. Seattle, WA.
5. *Klifton, C., Sapienza, A., Posner, M., **Rao, S.** (2015) Palmar Loads during Yoga. American College of Sports Medicine (Poster session), San Diego, CA.
6. *Chen, X., DiResta, G, Walker P., **Rao, S.** (2014) A Preliminary Investigation of the Biomechanical Effects of Osteoarthritis Variables in the Human First Metatarsophalangeal Joint Using A Finite Element Approach. (Finalist 2014 MS Student Paper Competition) World Congress of Biomechanics, Boston, MA.
7. **Rao, S.**, Schmidt, A.M., Kirsch, T., Mroczek, K. (2014). RAGE and Foot Function in Diabetic Foot Disease. Poster session at the Annual Meeting of the American Academy of Orthopaedic Surgeons, New Orleans, LA.
8. Hoeffner, F., Pomerantz, A., Feder, J., **Rao, S.** (2014). Regional plantar pressure and post-operative patient reported outcomes in individuals with cheilectomy and biplanar phalangeal osteotomy. Podium Presentation at the Combined Sections Meeting, American Physical Therapy Association, Las Vegas, NV.
9. Rome, K., Hillstrom, H.J., **Rao, S.** (2013). Inflammatory Arthropathies of the Foot and Ankle: Assessment and Non-pharmacological Foot Care Interventions. Symposium presented at the American College of Rheumatology / Association of Rheumatology Health Professionals, San Diego, CA.
10. *Chow, S. Siverling, S., **Rao, S.** (2012). Early Rehabilitation for Hip and Foot OA: Opportunities and Challenges. Symposium presented at the American College of Rheumatology / Association of Rheumatology Health Professionals, Washington DC.
11. **Rao, S.**, Gross, K.D., Niu, J., Nevitt, M., Torner, M., Lewis, C., Hietpas, J., Felson, D.T., Hillstrom, H.J. (2012). Are pressure time integral and cumulative plantar stress related to 1st metatarsophalangeal joint pain: The Multicenter Osteoarthritis Study. Poster session at the World Congress on Osteoarthritis, Barcelona, Spain.
12. **Rao, S.**, Hannan, M., Hillstrom, H.J. (2011). Foot Structure, Footwear and Foot Pain – Translating Evidence into Practice. Symposium presented at the American College of Rheumatology / Association of Rheumatology Health Professionals, Chicago, IL.

13. **Rao, S.,** Park, J.H., Chapman, C., Sheskier, S., Civarra, G., Weatherall, J., Mroczek, K. (2011). Inter- and Intra-rater reliability of radiographic scales used to grade 1st Metatarsophalangeal Joint Osteoarthritis. Poster session at the World Congress on Osteoarthritis, San Diego, CA.
14. **Rao, S.,** *Ripa, R. (2011). Gluteus Medius, Rectus Femoris, Peroneus Longus and Medial gastrocnemius Activation is Influenced by Footwear and Activity. Poster session at the International Society of Biomechanics, Brussels, Belgium.
15. **Rao, S.,** Nawoczenski D.A., Baumhauer, J.F. (2011). Kinematic effects of foot orthoses are task dependent. Poster session at the International Society of Biomechanics, Brussels, Belgium.
16. **Rao, S.,** Park, J.H., Chapman, C., Sheskier, S., Civarra, G., Weatherall, J., Mroczek, K. (2011). Reliability of Radiographic Grades Used to Assess 1st Metatarsophalangeal Joint Osteoarthritis. Poster session at the Summer Meeting, American Foot and Orthopedic Society, Denver, CO.
17. **Rao, S.,** Neville, C. (2011). Mechanisms Underlying Effectiveness of Foot Orthoses – A Translational Perspective. Symposium presented at the American College of Sports Medicine, Denver CO.
18. **Rao, S.,** Nawoczenski D.A., Baumhauer, J.F. (2010). Reliability of Active Foot Range of Motion in Individuals with Midfoot Arthritis and Matched Controls. Podium Presentation at the 2nd Congress of the International Foot and Ankle Biomechanics Community, Seattle, WA.
19. **Rao, S.,** Song, J., Demp, P., Backus, S., Ellis, S.J., Deland, J.T., Kraszewski, A., Hillstrom, H.J. (2010). Foot Architecture Affects 1st Metatarsophalangeal Joint Function. Poster session at the 2nd Congress of the International Foot and Ankle Biomechanics Community, Seattle, WA.
20. **Rao, S.,** *Lo, O.Y. (2010). Symmetry of Plantar Pressure during Self-Selected Walking, Fast Walking, Heel Raise and Sit-to-Stand Activities. Poster session at the American Society of Biomechanics, Providence, RI.
21. **Rao, S.,** Saha, I.K., Memon, N., Topkara, M., Dirik, A., Gutierrez, G.M. (2010). The Validity of Using Smartphones as a Step Counter. Poster session at the American Society of Biomechanics, Providence, RI.
22. **Rao, S.,** *Carter, S., Lo, O.Y. (2010). Reliability of Regional Plantar Pressure During Walking, Stair Ascent and Descent. Poster session at the American Society of Biomechanics, Providence, RI.
23. **Rao, S.,** *Chen, Y.W., Baumhauer, J.F., Nawoczenski D.A., Hillstrom, H.J. (2010). Principal Components Analysis to Assess Plantar Loading in Patients with Midfoot Arthritis and Matched Control Subjects. Poster session at the Joint meeting of the Gait and Clinical Movement Analysis Society and the European Society of Movement Analysis in Adults and Children, Miami, FL.
24. **Rao, S.,** *Lo, O.Y. (2010). Comparison of In-shoe Plantar Loading During Walking, Heel Raise and Sit-to-Stand Activities. Poster session at the Joint meeting of the Gait and Clinical Movement Analysis Society and the European Society of Movement Analysis in Adults and Children, Miami, FL.

25. **Rao, S.**, Baumhauer, J.F., Nawoczenski D.A. (2010). Functional metatarsal length in patients with midfoot arthritis. Podium Presentation at the Joint meeting of the Gait and Clinical Movement Analysis Society and the European Society of Movement Analysis in Adults and Children, Miami, FL.
26. Nawoczenski D.A., **Rao, S.**, Neville, C., Houck, J. (2010). How do Orthotic/Bracing Interventions Really Work? Instructional Course presented at the Combined Sections Meeting, American Physical Therapy Association, San Diego, CA.
27. **Rao, S.**, Baumhauer, J.F., Nawoczenski D.A. (2010). Comparison of in vivo multi-segment foot kinematics during a heel raise task in patients with midfoot arthritis and matched control subjects. Podium Presentation at the Combined Sections Meeting, American Physical Therapy Association, San Diego, CA.
28. **Rao, S.**, Baumhauer, J.F., Nawoczenski D.A. (2009). Barefoot plantar loading in patients with midfoot arthritis during walking. Poster presentation at the Annual Meeting of the European Society of Movement Analysis for Adults and Children, London, UK.
29. **Rao, S.**, Baumhauer, J.F., Nawoczenski D.A. (2009). Improvements in foot function following non-operative treatment in patients with midfoot arthritis – 4 week and 6 month follow up. Summer Meeting, American Foot and Orthopedic Society, Vancouver, Canada.
30. **Rao, S.**, Baumhauer, J.F., Nawoczenski D.A. (2009) (**Invited Poster**) Shoe inserts alter in vivo segmental motion in patients with midfoot arthritis. Orthopedic Research Society, Las Vegas, NV.
31. Stiskal, D., Rao, S. (2009). Understanding functional movements in patients with arthritis - quantitative strategies to examine the motor performance at hip, knee and foot. Study Group presentation at the American College of Rheumatology, Philadelphia, PA.
32. **Rao, S.**, Baumhauer, J.F., Nawoczenski D.A. (2008) Factors contributing to Impairments in Self-Reported Outcomes in Patients with Midfoot Arthritis. American College of Rheumatology, San Francisco, CA.
33. **Rao, S.**, Baumhauer, J.F., Nawoczenski D.A. (2008). Shoe inserts alter in vivo segmental motion in patients with midfoot arthritis. Podium presentation at the Summer Meeting, American Foot and Orthopedic Society, Denver, CO.
34. **Rao, S.**, Nawoczenski D.A., Houck, J. (2008). Optimizing Conservative Intervention for Patients with Midfoot Arthritis: Treatment Choices, Effects and Implications for Clinical Decision Making. Instructional Course presented at the Pedorthic Footwear Association Meeting, Nashville, TN.
35. **Rao, S.**, Baumhauer, J.F., Tome, J., Nawoczenski D.A. (2008). Comparison of In Vivo Segmental Foot Mobility during Walking and Step Descent in Patients with Midfoot Arthritis. Poster presentation at the 1st International Foot and Ankle Biomechanics Congress, Bologna, Italy.
36. **Rao, S.**, Saltzman, C.L., Yack, H.J. (2008). Plantar Fascia Thickness and First Metatarsal Mobility in Patients with Diabetes and Neuropathy. Podium presentation at the 1st International Foot and Ankle Biomechanics Congress, Bologna, Italy.

37. **Rao, S.**, Baumhauer, J.F., Tome, J., Nawoczenski D.A. (2008) Comparison of In Vivo Segmental Foot Mobility during Walking and Step Descent in Patients with Midfoot Arthritis. Podium presentation at the 1st International Foot and Ankle Biomechanics Congress, Bologna, Italy.
38. **Rao, S.**, Becica, L., Baumhauer, J.F., Nawoczenski D.A. (2008). The Effect of Foot Orthoses on Three-Dimensional Segmental Kinematics of the Foot in Patients with Midfoot Arthritis. Podium Presentation at the Annual Meeting, Gait and Clinical Movement Analysis Society, Richmond VA.
39. **Rao, S.**, Becica, L., Baumhauer, J.F., Nawoczenski D.A. (2008). Uncovering Mechanisms underlying the Effectiveness of Shoe Inserts in Patients with Midfoot Arthritis. Podium Presentation at the Combined Sections Meeting, American Physical Therapy Association, Nashville, TN.

As a Co-investigator or Collaborator or Mentor (indicates Graduate Student)*

40. *Ali, E., Ling, W., Len, A., Rao, S. (2016) Reliability of a New Clinical Gait Assessment Scale for Children with Idiopathic Toe Walking Gait. NEXT Conference and Exposition, American Physical Therapy Association, Nashville, TN.
41. *Chen, Y., Ling, W., Gutierrez, G., **Rao, S.** (2016) Coordination of Thorax, Pelvis and Thigh during Overground Walking with Arm Movement Perturbations. Combined Sections Meeting, American Physical Therapy Association, Anaheim, CA.
42. Sherman, O., Jazrawi, L., Garofolo, G., Alaia, M., Khan, H., Walker, P., **Rao, S.** (2013). In Vivo Knee Function in individuals after anterior cruciate ligament reconstruction with bone-patellar tendon-bone autograft – comparison of medial versus transtibial femoral tunnel placement. Poster presentation at the Annual Meeting of the American Orthopaedic Society for Sports Medicine, Chicago, IL.
43. Backus, S., Lenhoff, M., **Rao, S.** (2013). Kinesiographical Electromyography: Understanding the Technology and Clinical and Research Reports for the Non-Laboratory Therapist. Instructional Course presented at the Combined Sections Meeting, American Physical Therapy Association, San Diego, CA.
44. Len, A., **Rao, S.** (2013). Sensory processing impairments in children who are idiopathic toe-walkers. Poster presentation at the Combined Sections Meeting, American Physical Therapy Association, San Diego, CA.
45. Len, A., Ferrara, J., **Rao, S.** (2012) Understanding impairments in children who toe-walk – a comprehensive approach. Poster presentation at the Section on Pediatrics Annual Meeting, Orlando, FL.
46. Truchetet, A., Mootanah, R., **Rao, S.**, Hillstrom, H.J. (2011). Stress distribution in the 1st metatarsophalangeal joint for different foot types. Advances and New Developments in Osteoarthritis, Anglia Ruskin University, Chelmsford, UK.
47. **Rao, S.**, Miana, A., Lenhoff, M., Backus, S., Vanadurongwan, B., Chen, N., Hillstrom, H.J. (2010). Effect of plication on gleno-humeral translation – a preliminary study. Poster presentation at the American Society of Biomechanics, Providence, RI.

48. **Rao, S.,** Miana, A., Lenhoff, M., Backus, S., Vanadurongwan, B., Chen, N., Hillstrom, H.J. (2009). A Novel Method to Delineate Shoulder Kinematics – Reliability and Validity. Poster presentation at the Annual Meeting, American Society of Biomechanics, State College, PA 2009

As a Post-doctoral Fellow or Graduate Student:

49. **Rao, S.,** Baumhauer, J.F., Nawoczenski D.A. (2007). Uncovering the effects of shoe inserts on plantar loading in patients with midfoot arthritis. Podium presentation at the Summer Meeting, American Foot and Orthopedic Society, Toronto, Canada.
50. **Rao, S.,** Saltzman, C.L., Yack, H.J. (2007). The Relationship between Segmental Foot mobility and Loading in Individuals with and without Diabetes and Neuropathy. Podium presentation at the Combined Sections Meeting, American Physical Therapy Association, Boston, MA.
51. **Rao, S.,** Arthur, A., Fancher, B., Hentges, L., Massman, J., Vierling, A., Yack, H.J. (2007). Understanding Foot Structure and Function: the Relationship between First Ray and Ankle Stiffness and Plantar Pressures during Gait. Poster presentation at the Combined Sections Meeting, American Physical Therapy Association, Boston, MA.
52. **Rao, S.,** Saltzman, C.L., Yack, H.J. (2006). Segmental Foot Mobility in Individuals with and without Diabetes and Neuropathy. Poster presentation at the Annual Meeting, American Society of Biomechanics, Blacksburg, VA.
53. **Rao, S.,** Wilken, J.M., Saltzman, C.L., Yack, H.J. (2005) Changes in mechanical characteristics of the plantar flexors in individuals with diabetes mellitus. Poster presentation at the Annual Meeting, International Society of Biomechanics, Cleveland, OH.
54. **Rao, S.,** Saltzman, C.L., Yack, H.J. (2005). Comparison of Plantar Loading, Ankle Range of Motion and Ankle Stiffness in Individuals with and without Diabetic Neuropathy. Podium presentation at the Combined Sections Meeting, American Physical Therapy Association, New Orleans, LA.
55. **Rao, S.,** Saltzman, C.L., Yack, H.J. (2004). Ankle kinetics, kinematics and stiffness in normal children simulating pathological gait patterns. Poster presentation at the Annual Meeting, American Academy of Cerebral Palsy and Developmental Medicine, Los Angeles, CA.
56. **Rao, S.,** Saltzman, C.L., Yack, H.J. (2004). Plantar Loading, Ankle Range of Motion and Ankle Stiffness in Individuals with and without Diabetic Neuropathy. Poster presentation at the Summer Meeting, Academy of Orthopedic Foot and Ankle Surgeons, Seattle, WA.
57. **Rao, S.,** Saltzman, C.L., Yack, H.J. (2004). Plantar Loading, Ankle Range of Motion and Ankle Stiffness in Individuals with Diabetic Neuropathy. Poster presentation at the Annual Meeting, Gait and Clinical Movement Analysis Society, Lexington, KY.
58. **Rao, S.,** Dietz, F., Saltzman, C.L., Yack, H.J. (2003). Kinematics and Kinetics in Symptomatic and Asymptomatic Knees of Children with Myelomeningocele. Poster presentation at the Annual Meeting, Gait and Clinical Movement Analysis Society, Wilmington, DE.
59. **Rao, S.,** Yack, H.J., Hsu, M.J., Chandran, R., Nielsen, D. (2002). Effect of Prosthetic Foot-type and Walking Velocity on Vertical Ground Reaction Forces in Individuals with Transtibial Amputations.

Podium Presentation at the Annual Meeting, Gait and Clinical Movement Analysis Society, Chattanooga, TN.

60. Jobgen, B., Kipp, C., Rich, P., Turner, E., **Rao, S.**, Yack, H.J. (2001). The Effects of Varying Stride Frequency on Ground Reaction Forces in Recreational Runners. Poster presentation at the Combined Sections Meeting, American Physical Therapy Association, San Antonio, TX.

INVITED PRESENTATIONS:

Mendoza, M., **Rao, S.**, Kennedy, K. Interprofessional Education Group Grand Rounds, (2015, September), NYU School of Nursing, New York, NY.

Klepper, S., Andersen, R., **Rao, S.** (2013, November). "Update on the Orthotic Management of the Lower Extremity in Rheumatic Populations" Symposium presented at the American College of Rheumatology/Association of Rheumatology Health Professionals, San Diego, CA.

Rao, S. (2013 and 2015, October). "Best Foot Forward – From Theory to Practice" Graduate Seminar in Biomedical Engineering, Polytechnic Institute of New York University, Brooklyn, NY

Rao, S. (2012, November). "Midfoot Osteoarthritis: Evidence and Opportunities" Invited Keynote, International Society of Prosthetics and Orthotics – Sweden, Stockholm, Sweden.

Rao, S. (2011, October). "Biomechanical Pathways to Musculoskeletal Pain" Invited Presentation, Radiology Research Meeting, Hospital for Joint Diseases, New York University Langone Medical Center, New York, NY.

Rao, S. (2011, September). "3D Video Analysis of Running Comparing Injured and Healthy Runners" Invited Speaker and Expert Panelist, NYU Medical Center Rehabilitation Network; Running Symposium: A Multidisciplinary Approach to Treating the Runner Across Age, Gender, and Injury. NYU Langone Medical Center, New York, NY. New York, NY.

Rao, S. (2011, January). "Recent Advances in Musculoskeletal Management of the Foot and Ankle" Invited Speaker, K.J. Somaiya College of Physiotherapy, Maharashtra University of Health Sciences, India.

Rao, S. (2011, January). "3D Gait Analysis" Invited Speaker, Ramakrishna Mission Vidyalaya, Coimbatore, India.

Rao, S. (2011, January). "Recent Advances in Musculoskeletal Management of the Foot and Ankle" Invited Speaker, Sir Harkisondas Nurrotumdas Hospital and Research Centre, Mumbai, India.

Rao, S. (2010, September). "Kinematic and Kinetic Mechanisms accompanying Pain Relief in Patients with Midfoot Arthritis" Invited Speaker, Minimally Invasive Surgery Lab, Department of Orthopaedic Surgery, New York University Langone Medical Center, New York, NY.

Rao, S. (2010, July). "Kinematic and Kinetic Mechanisms accompanying Pain Relief in Patients with Midfoot Arthritis" Invited Speaker, Biomechanics Lab, Department of Orthopaedic Surgery, Hospital for Special Surgery, NY.

Rao, S. (2009, September). “Midfoot Osteoarthritis: Linking Impairments and Intervention” Invited Speaker, Glasgow Caledonian University, Glasgow, UK.

Rao, S. (2007, December). “Uncovering the Effect of Foot Orthoses in Patients with Midfoot Arthritis” Invited Speaker, Foot Biomechanics Boot Camp, Melbourne, Australia.

Rao, S. (2007, December). “Quantifying foot function in Midfoot Arthritis” Invited Speaker, Royal Children’s Hospital, Melbourne, Australia.

Rao, S. (2007, March). “A Matter of Balance”, Invited Speaker, Community Based Fall Prevention Program, St John’s Meadows senior living community, Rochester, NY.

Rao, S. (2007, April). “Best Foot Forward: Foot Health across the Lifespan”, Invited Speaker, Gerontology Institute, Ithaca, NY.

Rao, S. (2005, June). “Functional Anatomy and its Relevance - Foot and Ankle” Anatomy Seminar Series, Department of Anatomy, the University of Iowa, IA.

GRANTS:

Pending / In Review:

Co-Principal Investigator: Exercise intervention in diabetic peripheral neuropathy

Funding Agency: National Institutes of Health (09/01/2016-08/31/2021)

Amount: \$490,270 (\$246,546 direct costs)

Completed:

Faculty Collaborator: Studying Treatments and Effectiveness of Prosthetic Services (STEPS):

Utilizing a Regional Collaborative Longitudinal Outcome Database (CLOUD) (With Tamara Bushnik, PhD, Rusk Institute, Jason Maikos, PhD, Manhattan VA Harborcare)

Funding Agency: NIDRR (07/2013-06/2015)

Amount: \$ 600,000

Principal Investigator: Pain Sensitization in 1st Metatarsophalangeal Osteoarthritis

Funding Agency: Rheumatology Research Foundation Scientist Development Award (07/2012-06/2014)

Amount: \$ 125,000.00

Principal Investigator: RAGE and mechanics in diabetic foot disease

Funding Agency: National Center for Research Resources, National Institutes of Health, 5UL1RR029893. (04/2012-08/2013)

Amount: \$ 38,500.00 (\$ 25,000 direct costs)

Co-Investigator: Tibiofemoral kinematics after ACL reconstruction. (With PI: Peter Walker, PhD, Orrin Sherman, MD, and Laith Jazrawi, MD, Hospital for Joint Diseases)

Funding Agency: Private Foundation (09/2011-08/2013)

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

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Co- Principal Investigator: Optimizing outcomes in patients with venous ulcer: a randomized clinical trial (With Louis Iannuzzi, DPT, Miguel Sanchez, MD)

Funding Agency: New York Physical Therapy Association (06/09-06/11)
Amount: \$ 6000

Co-Principal Investigator: Inter-ACTT: Interactive Strategies Targeting Physical Activity through Technology (With Nasir Memon, PhD, Polytechnic Institute of NYU)

Funding Agency: Steinhardt Faculty Challenge technology Award, Summer Development Award
Amount: \$ 20,000

Principal Investigator: Optimizing Functional outcomes in Individuals with Midfoot Arthritis

Funding Agency: Arthritis Foundation, American Orthopedic Foot and Ankle Society Research Award
Amount: \$ 120,000

Research Assistant: Biophysical Determinants of Diabetic Foot Ulcer healing (PI: Charles Saltzman, Rita Franz)

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

Project Coordinator: Hormonal Fluctuations And The Potential For Injury In The Female Athlete (PI: H. John Yack)

Funding Agency: Organon Inc

Research Assistant. Kinematics and Kinetics of the Knee during Gait in Children with Myelomeningocele (PI: H. John Yack, Fredrick Dietz)

Funding Agency: Childrens Miracle Network (09/03-09/06)

Research Assistant. Effect of Prosthetic Foot-type in Individuals with Transtibial Amputations.

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

Funding Agency: Ossur Inc., Ottobock Inc. (06/00-06/02)

Research Assistant. The Iowa Bone Development Study (PI: Kathleen Janz)

Funding Agency: NIH R01 DE12101 & DE09551, The University of Iowa Oberman Center for Advanced Studies CASSPR Program. (01/01-06/01)

TEACHING

New York University (2008-present):

Doctor of Physical Therapy program

- Kinesiology/Biomechanics/Ergonomics (PT GE 2220, 5 sh)
- Physical Agents and Mechanical Modalities (PT GE 2215, 4 sh)
- Manual Techniques (PT GE 2008, 3 sh)
- Physical Therapy Examination of the Musculoskeletal System (PT GE 2251, 4 sh)
- Physical Therapy Interventions /Prevention /Wellness Programs for the Musculoskeletal System (PT GE 2261, 4 sh)

Master of Arts (specialization in Pathokinesiology)/ Ph.D. programs

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- Measurement and Evaluation in Human Motion

Clinical Residency in Orthopedic Physical Therapy program

- Didactic Lectures (Foot and Ankle anatomy, Pain, Inflammation and Repair) (PT GE 2615, 3 sh)
- Weekend Intensives (Foot and Ankle Module; Gait Analysis Module)

Master of Science in Occupational Therapy

- Guest lecturer in Kinesiology (OT GE 2710, 2 sh)

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:

New York University (208-present)

PhD Students

- Dipti Wani (2015-present)
- Eglal Ali (2014-present)
- On-Yee Lo, MA (2008-2010)
- Yen Wei Chen, MA (2008- 2015)
- Sylvester Carter, PT, MHS (2008-2015)
- S. Betty Chow (2008-2015)

MA Students

- Chutima Phanpho (2015)

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- Renata Ripa, MA (2010), Manthan Patel, PT (2010)
- Mohamed Ahmed, PT (2011)

MS Students

- Xiang Chen, MS (2012) co-advisor with Gene DiResta, PhD, PE

Director, Physical Therapy Research Internship program for Undergraduate and Post-baccalaureate Students

Ithaca College (2006-2008):

DPT Students (Research Mentor)

- 2008 Lindsay Drader, Michael Pro, Tyler Thurston, Stacey Rivet, Catherine Ebert
- 2007 Ashley Fox, Michele Tolpa, Kasey, Ryan Holm, Alison Helmsie, Anna Dube

The University of Iowa (2000-2006):

DPT Students (Research Mentor)

- 2005-2006 Christine Fletcher, Cory McCall, Katie vanArendonk, Jill Pedretti
- 2004-2005 Andrew Arthur, Brooke Fancher, Leah Hentges, Andrea Vierling
- 2003-2004 Tristan Boaldin, Jeffery Fleming, Alisa Schons, Nicole Summerlin
- 2002-2003 Kelli Brown, Kelly Ealy, Colleen Hurd, Paula Siems, Holly Zieske
- 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

PROFESSIONAL SERVICE:

Editorial Board Member:

- Foot and Ankle International (2013-present)

Reviewer for Scientific Peer Reviewed Journals:

- Archives of Physical Medicine and Rehabilitation (2008-present)
- Arthritis Care and Research (2012-present)
- Biomedizinische Technik (2008-present)
- BMC Musculoskeletal Disorders (2016-present)
- BMC Pediatrics (2016-present)
- Clinical Biomechanics (2008-present)
- Footwear Science (2013-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)

- Journal of Sport and Health Science (2016)
- Osteoarthritis and Cartilage (2011-present)
- Physical Therapy (2011-present)
- Scandinavian Journal of Rheumatology (2012, 2016)

Textbook Reviewer:

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

Grant Reviewer:

- American Society of Hand Therapists (ASHT) / American Hand Foundation (2016)
- DiabetesUK (2014)
- Research Foundation Flanders (2014)
- Orthopedic Section, American Physical Therapy Association (2012-13)
- Romanian National Research Council (2012)

Invited Commentaries:

- [The Rheumatologist](#) 2012
- 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
- [Lower Extremity Review](#) 2010
- [Lower Extremity Review](#) 2009

Program Committee and/or Session Chair:

- Gait and Clinical Movement Analysis Society 2011, 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)
- Osteoarthritis Research International (2012-2013)

DEPARTMENTAL, SCHOOL AND UNIVERSITY SERVICE:

- Department of Physical Therapy, Faculty Search Committee Chair (2015-2016)
- Department of Physical Therapy, Curriculum Committee (2008-present)
- Department of Physical Therapy, Technology Committee (2008-present)
- Department of Physical Therapy, Faculty Search Committee (2013)

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- Department of Physical Therapy, Class Advisor (2012-2015, 2015-2018)
- NYU-Steinhardt PhD in Rehabilitation Science Working Group (2011-present)
- NYU-Steinhardt-Rusk Collaborative Research Group (2010-present)
- NYU-Steinhardt Faculty Council (2013, 2015)

CLINICAL SERVICE:

Certifications

- Patanjali Yoga Instructor (1996)
- Power Pilates Beginner Mat Training Certification (2011)

Continuing Education (*Courses Taken in last five years listed below. For courses taught, please see sections on Conference Presentations and Teaching above*)

- Combined Sections Meeting, American Physical Therapy Association, Las Vegas, NV 2014
- Annual Meeting of the American Academy of Orthopedic Surgeons, New Orleans, LA, 2014
- Manual Therapy of the Foot and Ankle, Hospital for Special Surgery, June 9, 2012,
- American College of Rheumatology/Association of Rheumatology Health Professionals, Washington DC, 2012
- World Congress on Osteoarthritis, Barcelona, Spain 2012
- 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
- Annual Meeting, American Society of Biomechanics, Providence, RI 2010
- 2nd Congress of the International Foot and Ankle Biomechanics Community, Seattle, WA 2010

Clinical Experience

- May 2016-present Per Diem Physical Therapist**
Center for Musculoskeletal Care, NYU Langone Medical Center, New York, NY
- June 2015- present Physical Therapist**
Academy Physical Therapy, New York, NY
- June 2011-Nov 2012 Physical Therapist**
Madison Avenue Orthopaedic Associates, New York, NY
- June 2007-March 2008 Pro Bono Physical Therapist**
Sisters of St Joseph's Neighborhood Center, Rochester, NY
- Nov 2005-July 2006 PRN, Physical Therapist**
University of Iowa Hospitals and Clinics, Iowa City, IA
Acute Care, Internal Medicine
- Jan –Aug 1999 Trainee, Physical Therapist**
Ashwini Back Institute and Institute for Spinal Surgery
- Aug 1998 – Mar 2000 Masters Student, Junior Physical Therapist**
L.T.M. Medical College and Municipal Hospital, Mumbai, India

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Jan – May 1998

Internship

Seth G.S. Medical College, King Edward Memorial Hospital, Mumbai, India