Stanford

Julie Kolesar

Research Engineer

Bioengineering

Bio

BIO

Julie Kolesar is a Research Engineer in the Human Performance Lab, supporting teaching and interdisciplinary research at the crossroads of engineering, sports medicine, and athletics. Her work aims to understand the underlying mechanisms relating biomechanical changes with function and quality of life for individuals with musculoskeletal disorders and injuries. As part of the Wu Tsai Human Performance Alliance, Dr. Kolesar engages in collaborations which seek to optimize human health and performance across the lifespan. Her expertise and research interests include experimental gait analysis, musculoskeletal modeling and simulation, and clinical interventions and rehabilitation.

ACADEMIC APPOINTMENTS

- Research Engineer, Bioengineering
- Member, Wu Tsai Human Performance Alliance

PROFESSIONAL EDUCATION

- Ph.D., The Ohio State University , Mechanical Engineering (2013)
- M.S., The Ohio State University , Mechanical Engineering (2009)
- B.S., The Ohio State University , Mechanical Engineering (2008)

LINKS

- Google Scholar Profile: https://scholar.google.com/citations?user=OyKga9AAAAAJ&hl=en
- Human Performance Lab: https://ortho.stanford.edu/humanperformance.html
- Neuromuscular Biomechanics Lab: https://nmbl.stanford.edu/
- Wu Tsai Human Performance Alliance Stanford: https://humanperformance.stanford.edu/

Research & Scholarship

CLINICAL TRIALS

- Long-Term Effectiveness of Walking Training in Patients With Knee Osteoarthritis, Not Recruiting

Publications

PUBLICATIONS

- **REDUCED COMPRESSIVE & SHEAR FORCES FROM GAIT RETRAINING RELATE TO SLOWED CARTILAGE DEGENERATION**
  Seagers, K., Kolesar, J. A., Mazzoli, V., Halilaj, E., Delp, S., Uhlrich, S.
  ELSEVIER SCI LTD.2024: S28-S29

- **Can static optimization detect changes in peak medial knee contact forces induced by gait modifications?** *Journal of biomechanics*
  Kaneda, J. M., Seagers, K. A., Uhlrich, S. D., Kolesar, J. A., Thomas, K. A., Delp, S. L.
  2023; 152: 111569

- **Personalization improves the biomechanical efficacy of foot progression angle modifications in individuals with medial knee osteoarthritis.** *Journal of biomechanics*
  Uhlrich, S. D., Kolesar, J. A., Kidzinski, L., Boswell, M. A., Silder, A., Gold, G. E., Delp, S. L., Beaupre, G. S.
  2022; 144: 111312

- **Muscle coordination retraining inspired by musculoskeletal simulations reduces knee contact force.** *Scientific reports*
  Uhlrich, S. D., Jackson, R. W., Seth, A., Kolesar, J. A., Delp, S. L.
  2022; 12 (1): 9842

- **Changes in foot progression angle during gait reduce the knee adduction moment and do not increase hip moments in individuals with knee osteoarthritis.** *Journal of biomechanics*
  Seagers, K., Uhlrich, S. D., Kolesar, J. A., Berkson, M., Kaneda, J. M., Beaupre, G. S., Delp, S. L.
  2022; 141: 111204

- **A neural network to predict the knee adduction moment in patients with osteoarthritis using anatomical landmarks obtainable from 2D video analysis.** *Osteoarthritis and cartilage*
  Boswell, M. A., Uhlrich, S. D., Kidzinski, L., Thomas, K., Kolesar, J. A., Gold, G. E., Beaupre, G. S., Delp, S. L.
  2021

- **Bone changes in the lower limbs from participation in an FES rowing exercise program implemented within two years after traumatic spinal cord injury** *JOURNAL OF SPINAL CORD MEDICINE*
  Lambach, R. L., Stafford, N. E., Kolesar, J. A., Kiratli, B., Creasey, G. H., Gibbons, R. S., Andrews, B. J., Beaupre, G. S.
  2020; 43 (3): 306–14

- **SIX WEEKS OF PERSONALIZED GAIT RETRAINING TO OFFLOAD THE MEDIAL COMPARTMENT OF THE KNEE REDUCES PAIN MORE THAN SHAM GAIT RETRAINING**
  Uhlrich, S. D., Kolesar, J. A., Silder, A., Berkson, M. Z., Presten, B., Montague-Alamin, H. A., Edouard, N., Willoughby, D., Finlay, A. K., Gold, G. E., Delp, S. L., Beaupre, G. S.
  ELSEVIER SCI LTD.2019: S28

- **Bone changes in the lower limbs from participation in an FES rowing exercise program implemented within two years after traumatic spinal cord injury.** *The journal of spinal cord medicine*
  Lambach, R. L., Stafford, N. E., Kolesar, J. A., Kiratli, B. J., Creasey, G. H., Gibbons, R. S., Andrews, B. J., Beaupre, G. S.
  2018: 1–9

- **Age Influences Biomechanical Changes After Participation in an Anterior Cruciate Ligament Injury Prevention Program** *AMERICAN JOURNAL OF SPORTS MEDICINE*
  Thompson-Kolesar, J. A., Gatewood, C. T., Tran, A. A., Silder, A., Shultz, R., Delpt, S. L., Dragoo, J. L.
  2018; 46 (3): 598–606

- **Age-Related Differences in Gait Kinematics, Kinetics, and Muscle Function: A Principal Component Analysis.** *Annals of biomedical engineering*
  Schloemer, S. A., Thompson, J. A., Silder, A., Thelen, D. G., Siston, R. A.
  2017; 45 (3): 695-710

- **Biomechanical Effects of an Injury Prevention Program in Preadolescent Female Soccer Athletes** *AMERICAN JOURNAL OF SPORTS MEDICINE*
  Thompson, J. A., Tran, A. A., Gatewood, C. T., Shultz, R., Silder, A., Delp, S. L., Dragoo, J. L.
  2017; 45 (2): 294-301

- **Muscle Forces and Their Contributions to Vertical and Horizontal Acceleration of the Center of Mass During Sit-to-Stand Transfer in Young, Healthy Adults** *JOURNAL OF APPLIED BIOMECHANICS*
  Caruthers, E. J., Thompson, J. A., Chaudhari, A. M., Schmitt, L. C., Best, T. M., Saul, K. R., Siston, R. A.
  2016; 32 (5): 487-503

- **Gluteus maximus and soleus compensate for simulated quadriceps atrophy and activation failure during walking** *JOURNAL OF BIOMECHANICS*

Thompson, J. A., Chaudhari, A. W., Schmitt, L. C., Best, T. M., Siston, R. A.
2013; 46 (13): 2165–72

- **Biomechanical Effects of Total Knee Arthroplasty Component Malrotation: A Computational Simulation** *JOURNAL OF ORTHOPAEDIC RESEARCH*
  Thompson, J. A., Hast, M. W., Granger, J. F., Piazza, S. J., Siston, R. A.
  2011; 29 (7): 969–75