

La Crosse Institute For Movement Science (LIMS)

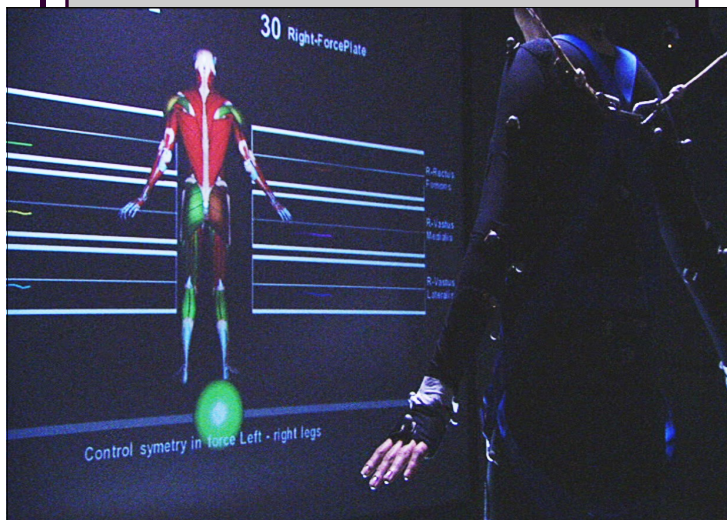
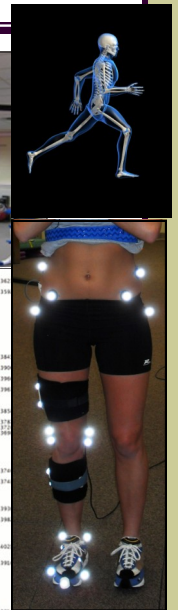
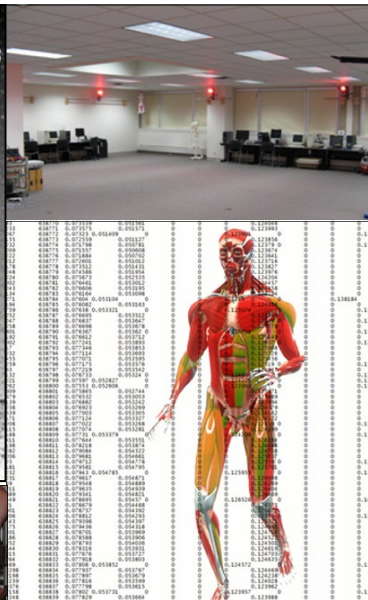
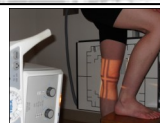
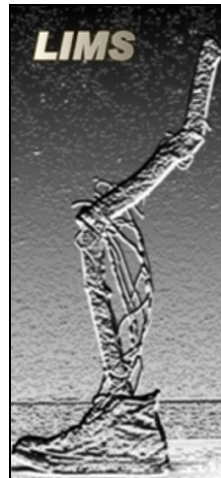
Thomas Kernozek, PhD, Director



The Institute was created in 2005 at the University of Wisconsin-La Crosse in the Department of Health Professions in the Health Science Center. The Institute brings together scientists and clinicians of various disciplines seeking new knowledge related to human movement, factors related to injury, the foundations of therapeutic exercise used in the treatment and rehabilitation of injury.

Each year over 40 students from graduate and undergraduate programs across the UW-L campus are involved in laboratory research including Physical Therapy, Exercise and Sport Science, Physics, and Biology. High technology funding from the State of Wisconsin supports 8 Physics Biomedical student internships in the lab.

The clinical biomechanics laboratory has a national reputation from published and presented work.



Current Projects

- Understanding mechanisms of non-contact ACL injuries in females.
- Evaluating patellofemoral joint stresses with running mechanics of females with patellofemoral pain.
- Examining the effects of multifrequency vibration on blood flow and muscle activation.
- Evaluating changes in bone stresses during running in those with a previous history of stress fracture.

LIMS Scientists

Chris Durall, DPT, ATC, MSPT (UW-La Crosse Health Center)

John Greany, PT, PhD, Exercise Physiologist, (Health Professions)

Thomas Greiner, PhD, Biological Anthropologist, (Health Professions)

Di-An Hong, PhD, Biomechanist, (Laboratory Manager, Health Professions)

Tom Kernozek, PhD, Biomechanist, (Health Professions)

Stacey Meardon, PT, ATC, PhD, Biomechanist/Motor Control, (Health Professions)

Robert Ragan, PhD, Computational Physicist (Physics)

LIMS acquires HBM System

LIMS partnered with Motek Medical (Netherlands) to evaluate HBM system for the quantitative assessment of human movement. The HBM system uses motion capture, external forces and muscle activation to estimate muscle forces in real time. These measurements allow researchers to better understand tissue stresses of movement leading to acute/overuse injury or muscle force generation during rehabilitation exercises. The system is located in the 2,250 square foot clinical biomechanics laboratory.

Recently Published or In Press Research

Song, C.Y., Peng, H.S., Kernozek, T.W. (in press). Muscle Activation of Vastus Medialis Obliquus and Vastus Lateralis during a Dynamic Leg Press Exercise with and without Isometric Hip Adduction. *Physical Therapy in Sport*.

Bolt, A., Willson, J.D., Barrios J.A., Kernozek, T.W. (in press). Effects of Medially Wedged Foot Orthoses on Knee and Hip Joint Running Mechanics in Females with and without Patellofemoral Pain Syndrome. *Journal of Applied Biomechanics*.

Kernozek, T.W., Greany, J.F., Heizler, C. (in press). Plantar Loading Asymmetry in Native Americans with Diabetes and Peripheral Neuropathy. Diabetes and those without Diabetes. *Journal of the American Podiatric Medical Association*.

Wirtz, A., Willson, J.D., Kernozek, T.W., Hong, D. (in press). Patellofemoral Joint Stress During Running in Females with and without Patellofemoral Pain. *The Knee*.

Durall, C., Greene, P., Kernozek, T.W. (2012) A comparison of two tests of trunk flexor endurance. *Journal of Strength and Conditioning Research*. 26(7):1939-44.

Greene, P., Durall, C., Kernozek, T.W. (2012). Intersession Reliability and Concurrent Validity of Isometric Endurance Tests for the Lateral Trunk Musculature. *Journal of Sports Rehabilitation*. 21(2):161-6.

Kernozek, T.W., Ragan, R., Willson J.D., Koehler, C., Lopez, T. (2012). Variation of Anatomical and Physiological Parameters that Affect Estimates of ACL Loading during Drop Landing. *Open Orthopedics Journal*. 6:245-249.

Rogatzki, M.J., Kernozek, T.W., Willson, J.D., Greany, J.F., Hong, D., Porcari, J.P. (2012). Differences in peak muscle activation, joint kinematics and kinetics during an elliptical and a stepping movement pattern while using the precor amt trainer. *Research Quarterly in Exercise and Sport*. 83(2):152-9.

Southard, J., Kernozek, T.W., Ragan, R., Willson, J.D. (2012) ACL tension in landing with typical and flexed postures. *International Journal of Sports Medicine*. 33(5): 381-385.

Durall, C., Kernozek, T.W. (2011). Association between single-leg postural control and drop-landing mechanics in healthy females. *Journal of Sports Rehabilitation*. 20:406-418.

Peng, H., Kernozek, T.W., Song, C. (2011). Quadricep and hamstring activation levels with changes in drop height. *Physical Therapy in Sport*. 12(3):127-32.

Lubahn, A.J., Kernozek, T.W., Tyson, T.L., Merkitch, K.W., Reutemann, P., Chestnut, J.M. (2011) Hip muscle activation and knee frontal plane motion during weight bearing therapeutic exercises. *The International Journal of Sports Physical Therapy*. 6(2): 92-103.

Laughlin, W.A., Weinhandl, J.T., Kernozek, T.W., Cobb, S.C., Keenan, K.G., O'Connor, K.M. (2011). The effects of single-let landing technique on ACL loading. *Journal of Biomechanics*. 44(10)-1845-1851.

Willson, J.D., Kernozek, T.W., Reznichuk, D., Arndt, B. (2011). Gluteal muscle activation during running in females with patellofemoral pain. *Clinical Biomechanics*. 26(7): 735-740.

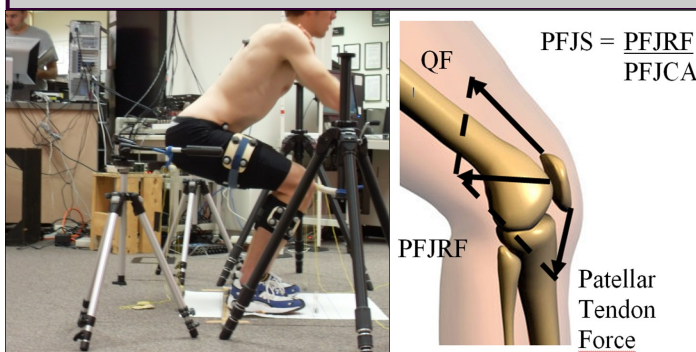
Olson, T.J., Chebny, C., Willson, J.D., Kernozek, T.W., Straker, J.S. (2011). Comparison of 2D and 3D kinematic changes during a single leg step down following neuromuscular training. *Physical Therapy in Sport*. 12(2): 93-99.

UNIVERSITY of WISCONSIN
LA CROSSE

LIMS Reputation Continues to Rise

LIMS in the Department of Health Professions enabled the Physical Therapy Program to reach in strategic goal of publishing 25 peer reviewed papers over a 3 year span. LIMS researchers accomplished this in two!!! This distinguishes the Physical Therapy program in the upper tier of scholarly output nationally in physical therapy education. This could not have been done without dedicated faculty and student scholars. Congratulations on a job well done!

Rose Excellence in Research Awarded to John Willson, Tom Kernozek, Rebecca Arndt, Dan Reznichuk, & Scott Straker at the Combined Sections Meeting of the American Physical Therapy Meeting on 2/10/12 for their paper "Gluteal muscle activation during running in females with patellofemoral pain" published in Clinical Biomechanics.

For more information contact:

Tom Kernozek, PhD, Director of LIMS
4071 Health Science Center
University of Wisconsin—La Crosse
1300 Badger Street
La Crosse, WI 54601
608-785-8468
<http://perth.uwlax.edu/pt/LIMS.htm>
tkernozek@uwlax.edu

