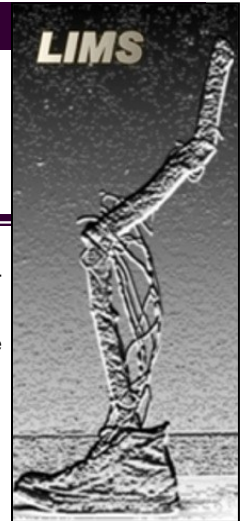


La Crosse Institute For Movement Science (LIMS)

Thomas Kernozek, PhD, FACSM, Director



The Institute was created in 2005 at the University of Wisconsin—La Crosse in the Department of Health Professions, Physical Therapy Program. Dr. Tom Kernozek is the founding director.

LIMS brings together scientists and clinicians from various disciplines seeking applied knowledge related to human movement, factors related to injury, and in the foundations of therapeutic exercise used in the treatment and rehabilitation of injury.

Annually over 75 students from graduate and undergraduate programs from the UW-L campus are involved in laboratory research from Physical Therapy, Occupational Therapy, Data Science, Physics, Exercise and Sport Science, and Biology. High-technology funding from the State of Wisconsin supports Physics Biomedical student internships in the laboratory. Gundersen Medical Foundation annually supports Sports Medicine researcher Nate Vannatta as a clinical research collaborator. We also have an active research partnerships with Emplify/Gundersen Health System and the Mayo Clinic (La Crosse).

Due to the many publications from the clinical biomechanics laboratory, LIMS has developed a national/international reputation.

LIMS Group makes an Impact at ACSM Meeting in Georgia

We had a stellar group of faculty and students attend the ACSM Annual Meeting in Atlanta. Tom Kernozek, Ward Dobbs, Shane Murphy, Steni Sackiriyas and Drew Rutherford attended for the faculty. Colton Brand, Brandon Bernardo, Makenna Carpenter, Kellie Hierl, Grace Rudek, Kayla Lass and Sidney Smith attended as Physical Therapy Students (shown from left to right). Impressively, we had 8 posters presented (2 were thematic posters). It was very cool to see our students do so well by professionally responding to questions from other scholars. Thanks to UWL Graduate and Extended Learning for partially funding this opportunity for our students.



Grace Rudek awarded a BIG travel award

BIG also known as the Biomechanics Interest Group, provides various grants and awards for exemplary work by graduate students. This year Grace Rudek was awarded a competitive travel award. Grace had 2 presentations at this years meeting, one on patellofemoral joint loading in split squat and a second thematic poster on the use of various cuing strategies in running and their influence on Achilles tendon loading. Her faculty mentor was Tom Kernozek. This was an outstanding achievement by Grace! Grace is shown in the middle (photo right) between Melvin Megia and Maria Pasquale from Novel who sponsored this travel award.



The Health Science Center is home to the La Crosse Medical Health Science Consortium, a unique partnership between Gundersen Health System, Mayo Clinic Healthcare La Crosse, Western Technical College, Viterbo University and La Crosse Public Schools. The building serves as the core of many educational, community partnerships/programs, and research activities. LIMS and the Physical Therapy program has grown along with the HSC into one of central research hubs at UW-La Crosse. Faculty and student research outcomes have distinguished UWL and the doctoral program in Physical Therapy Program.

New Colleagues/New Labs/New Focus

Enhancing Movement, Pelvic Outcomes, and Wellness Research (EMPOWER)

The EMPOWER lab is led by Dr. Lisa VanWiel, PT, DPT, PhD. Dr. VanWiel has clinical expertise in pelvic floor dysfunction and has research experience in health promotion and physical activity epidemiology. This lab will investigate the interactions of pelvic floor dysfunction, physical activity, and wellness throughout the lifespan. Current investigations in the lab focus on periods of critical risk for the development of pelvic floor dysfunction (athletics, pregnancy/postpartum, and surrounding menopause).



The Exercise Physiology Lab is led by Dr. Ward Dobbs, PhD, CSCS*D. Dr. Dobbs has experience working with sport and tactical athlete populations. Dr. Dobbs takes an integrative physiological approach to identify markers of fatigue and optimizing human performance. Dr. Dobbs has long standing collaborations with multiple laboratories across the UWL campus, Mayo Clinic, and the United States Army Research Institute of Environmental Medicine. These interdisciplinary networks have allowed for good bridging of expertise, resource sharing, and the development of innovative research projects that address complex problems in human performance and health. Together, Drs. VanWiel and Dobbs have been working to acquire new equipment and increase the capabilities of both the EMPOWER and Exercise Physiology labs to further expand the collaborative network of LIMS.

LIMS Scientists

Hanni Cowley, DPT, Clinical Research (Health Professions)

Ward Dobbs, PhD, Exercise Physiology, Human Performance (Health Professions)

Patrick Grabowski, PT, PhD, OCS, CSCS, Motor Control/Biomechanics, (Health Professions)

Naghmeh Gheidi, PhD, Biomechanist, (Health Professions, Occupational Therapy)

Becky Heinert, MSPT, SCS, Clinical Research (Winona State University)

Tom Kernozek, PhD, FACSM, Biomechanist, (Health Professions)

Shane Murphy, ATC, PhD, Motor Control/Biomechanics (Health Professions)

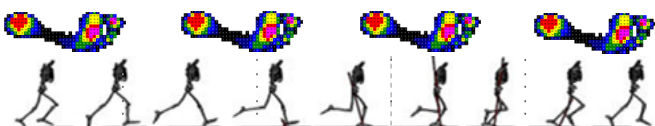
Drew Rutherford, MS, Laboratory Manager/Engineer (Health Professions)

Nate Vannatta, DPT, SCS, (Gundersen Sports Medicine)

Lisa VanWiel, PT, PhD (Pelvic Health, Exercise Physiology)

Robert Ragan, PhD, Computational Physicist (Physics)

Kanikkai "Steni" Sackiriyas, PT, DSc, Clinical Biomechanics (Health Professions)



Recently Published or In Press Research (2024-2025)

Kiminski R, Williams C, Heinert B, Mills O, Cluppert K, Rutherford D, Kernozek T. Transfer of post-trial feedback on impacts during drop landings in female athletes. *Sports Biomech.* 2025 Feb;24(2):388-402. doi: 10.1080/14763141.2022.2114931. Epub 2022 Aug 30. PMID: 36039917.

Jaime H, Rutherford D, Heinert B, Vannatta CN, Toribio S, Kernozek TW. Augmented Feedback Response Prediction by Peak Vertical Ground Reaction Force in Adolescent Female Athletes. *Int J Sports Phys Ther.* 2025 Jan 2;20(1):48-55. doi: 10.26603/001c.127139. PMID: 39758691; PMCID: PMC11697990.

Vannatta CN, Kernozek TW. Isometric hip strength does not directly influence injury in collegiate cross-country runners: a prospective cohort study. *Phys Ther Sport.* 2025 Jul 18;75:58-63. doi: 10.1016/j.ptsp.2025.07.006. Epub ahead of print. PMID: 40712248.

Zavala P, Heinert B, Rudek G, Rutherford DN, Matheson JW, Kernozek TW. Effects of augmented feedback on landing mechanics after anterior cruciate ligament reconstruction in collegiate females compared to healthy controls. *Phys Ther Sport.* 2025 May;73:1-8. doi: 10.1016/j.ptsp.2025.02.008. Epub 2025 Feb 26. PMID: 40037261.

Gheidi N, Kiminski R, Besch M, Ristow A, Wallace B, Kernozek T. Patellofemoral Joint Stress During Front and Back Squats at Two Depths. *Applied Sciences.* 2025; 15(16):8784. <https://doi.org/10.3390/app15168784>

VanWiel, L. L., Carr, L. J., Bond, D. S., Wu, Y., Tunitsky-Biton, E., Tulikangas, P., Steinberg, A. C., & Whitaker, K. M. (2025). Associations of urinary incontinence, physical activity and cardiovascular disease risk among women in the United States. *Preventive Medicine*, 108277. <https://doi.org/10.1016/j.ypmed.2025.108277>

VanWiel, L., Conway, G. V., Carr, L. J., Gorzelitz, J., Story, W. T., & Whitaker, K. M. (2025). Associations of urinary incontinence with postpartum physical activity: A cross-sectional study. *Midwifery*, 148, 104535. <https://doi.org/10.1016/j.midw.2025.104535>

VanWiel, L., Butler, O., Carr, L. J., Gorzelitz, J., Story, W. T., & Whitaker, K. M. (2025). A qualitative analysis of postpartum women's experiences with urinary incontinence and physical activity. *Midwifery*, 104591. <https://doi.org/10.1016/j.midw.2025.104591>

Jagim AR, **Dobbs WC**, Horswill CA, Twohey EE, Fields JB, Jones MT. (2025). Prevalence and magnitude weight loss among collegiate wrestlers: have practices changed?. *Journal of the International Society of Sports Nutrition*, 22(sup2). <https://doi.org/10.1080/15502783.2025.2550144>

Twohey EE, **Dobbs WC**, Malone CM, Fields JB, Jones MT, Jagim AR. (In Press). The use of a consumer-grade bioelectrical impedance analysis device for weight certification in collegiate wrestling: Implications for minimal wrestling weight determination. *Journal of Strength & Conditioning Research*.

Fenn SA, Dobbs WC, Walker MK, Scheuermann B, Caldwell JT. (2025). Investigating microvascular outcomes with ischemic preconditioning and passive stretch. *Physiological Reports*. 13(15), e70474

VanZile A, Jones D, McHugh L, Clickovich G, Morales M, Reimschisel R, Widenhoefer T, Boos A, Baughman J, Urquidí M, Connor D, **Dobbs WC**, Jagim A, Luedke J, Almonroeder TG. (2025). Comparison of countermovement jump performance and dynamic balance among male high school athletes with varying levels of sports specialization. *Journal of Strength and Conditioning Research*, <https://doi.org/10.1519/jsc.0000000000005200>

Dobbs WC, Almonroeder TG, Carpenter M, Schmitt R, Jacobson A, Luedke J, Roberts B, Jagim A. (2025). Relationship between the Army combat fitness test scoring structure and laboratory measurements of physical fitness. *Journal of Strength and Conditioning Research*, 16;39(7):798-808. doi: 10.1519/JSC.00000000000005117

Jagim A, Horswill C, **Dobbs WC**, Twohey E, Tinsley G, Oppliger R, Fields J, Jones M. (2025). Minimum wrestling weight for high school girls wrestling: Time to revisit minimal body fat percentage. *Journal of Strength and Conditioning Research*, 39(3): 332-339.

Faculty are in **Bold**, Students or residents are in *italics*

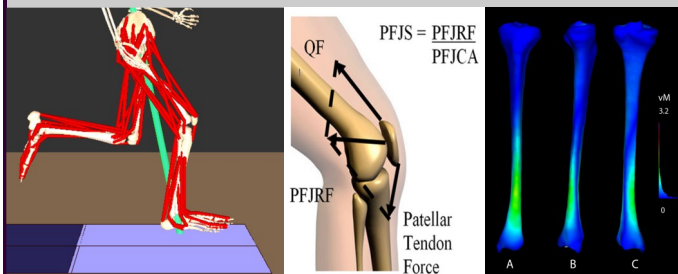
LIMS faculty collaborate with the Gundersen Sports Physical Therapy Residency Research Program and Mayo Clinic Healthcare Research Partnership.

**We measure your movement performance!**

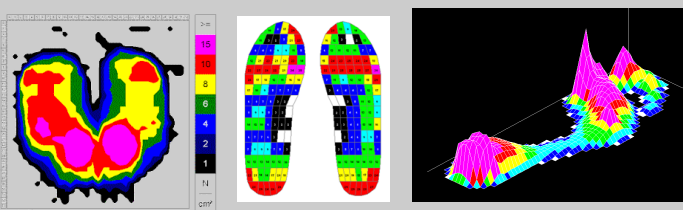
Our laboratories have sophisticated equipment to measure motion, impact forces, pressures on the feet or seat, muscle activation, energy cost, respiration and heart rate, or imaging of tendons or other soft tissues.

These data can be used to determine the loading on joints and muscles to give insight to how and why injuries may occur or for the improvement of performance to keep you active.

Musculoskeletal models are used to examine loading on bone, joints, ligaments, and tendons (shown below).



Loading in seating or during walking or running (shown below). Hotter colors depict higher loading in these anatomical areas.



Did you know our LIMS researchers presented over 25 abstracts nationally in 2024-2025?

Combined Sections Meeting of the American Physical Therapy Association, American Heart Association, American Society of Biomechanics, National Strength & Conditioning Association, American College of Sports Medicine, Occupational Therapy Annual Meeting.



The Physical Therapy and Occupational Therapy students annually present posters at the UWL Research and Creativity Day. That is 65 students mentored in research by Health Professions faculty.

For more information contact:

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LIMS on
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