CURRICULUM VITAE

Miranda **Polly McGuigan** PhD, BSc
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PRESENT APPOINTMENT

(from 2022) Head of Department for Health, University of Bath

Senior Lecturer in Biomechanics

I lead and manage a department of approximately 70 academic staff; 50 research, technical and professional services staff; 100 PGR and 1200 PGT and UG students. Creating a collegiate atmosphere to enable excellence, nurture talent and create opportunity across the full portfolio of academic activity.

PREVIOUS APPOINTMENTS

2018 – 2022	Deputy Head of Department and Senior Lecturer in Biomechanics, Department for Health, University of Bath
2005 - 2018	Lecturer in Biomechanics, Department for Health, University of Bath
2003 - 2005	Research Fellow - Concord Field Station, Harvard University *Limb muscle dynamics during steady and unsteady locomotion*
2002 – 2003	Research Fellow – School of Biology, University of Leeds *Mechanical performance of bird flight muscles*
2000 – 2002	Postdoctoral Research Associate - The Royal Veterinary College, University of London *Does muscle and surface damping of limb vibration prevent injury in the racehorse?*

QUALIFICATIONS

2001	PhD, The Royal Veterinary College, University of London *The scope for adjustment of distal limb mechanics in the horse (Equus caballus)*
1997	BSc Hons Zoology, University of Bristol

RESEARCH

My research focuses on how the neuromuscular system powers and controls locomotion in humans and animals, how it changes with age and injury, and ways in which its performance can be enhanced through training and assistive technology. This research is multidisciplinary in nature and has applications in many spheres of medicine, physiotherapy, veterinary, sports science and engineering.

GRANT FUNDING

2020-2025	Co-I Centre for the Analysis of Motion, Entertainment Research and Applications (CAMERA) - 2.0 (EPSRC) £1,122,607.20
2020-2024	Co-I Analysis of Spinal Injury in Horseracing (Racing Foundation) £186,059.69
2021-2022	Co-I IAA – Real World Evaluation of a Powered Intelligent Prosthetic Ankle (EPSRC) £27,591.65
2019-2022	Co-I CAMERA MC2 Award (EU Horizon 2020) £189,889.94
2015-2021	Co-I Centre for the Analysis of Motion, Entertainment Research and Applications (CAMERA) (EPSRC) £824,464.00
2013-2018	Co-I Arthritis Resesarch UK Centre for Sport and Exercise Injuries £126,418.00

SELECTED PUBLICATIONS

Wan, Y., **McGuigan, P.,** Bilzon, J. & Wade, L. (2024) The effect of foot orientation modifications on knee joint biomechanics during daily activities in people with and without knee osteoarthritis. *Clinical Biomechanics*. 117, 106287.

Liang, I. J., Perkin, O. J., Williams, S., **McGuigan, P. M.**, Thompson, D. & Western, M. J. (2024) The Efficacy of 12-week Progressive Home-Based Strength and Tai-Chi Exercise Snacking in Older Adults: A Mixed-Method Exploratory Randomised Control Trial. *The Journal of Frailty & Aging*. 10

Wan, Y., **McGuigan, P.**, Bilzon, J. & Wade, L. (2023) The effectiveness of a 6-week biofeedback gait retraining programme in people with knee osteoarthritis: protocol for a randomised controlled trial. *BMC Musculoskeletal Disorders*. 24, 984.

Wade, L., Needham, L., Evans, M., **McGuigan, P**., Colyer, S., Cosker, D. & Bilzon, J. (2023) Examination of 2D frontal and sagittal markerless motion capture: Implications for markerless applications. *PLoS ONE*. 18, 11, 16 p., e0293917.

Cassidy, R. P., Lunt, K. M., Coppack, R. J., Bennett, A. N., Bilzon, J. L. J., **McGuigan, M. P**., Egginton, N., Sellon, E., Day, J. & Ladlow, P. (2023) ADAPTations to low load blood flow restriction exercise versus conventional heavier load resistance exercise in UK military personnel with persistent knee pain: protocol for the ADAPT study, a multi-centre randomized controlled trial. *BMC Musculoskeletal Disorders*. 24, 1, 580.

Lucas, D., Stokes, K., **McGuigan, P.**, Hill, J. & Cazzola, D. (2022) Consensus on a jockey's injury prevention framework for video analysis: a modified Delphi study. *BMJ Open Sport & Exercise Medicine*. 8, 4, e001441.

Needham, L., Evans, M., Wade, L., Cosker, D. P., **McGuigan, M. P.**, Bilzon, J. L. & Colyer, S. L. (2022) The development and evaluation of a fully automated markerless motion capture workflow. *Journal of Biomechanics*. 144, 9 p., 111338.

Wade, L., Needham, L., **McGuigan, P**. & Bilzon, J. (2022) Applications and limitations of current markerless motion capture methods for clinical gait biomechanics. *PeerJ*, vol. 10, e12995.

Needham, L., Evans, M., Cosker, D., Wade, L., **McGuigan, P.**, Bilzon, J. & Colyer, S. (2021) The Accuracy of Several Pose Estimation Methods For 3D Joint Centre Localisation', *Scientific Reports*, vol. 11, no. 1, 20673.

Perkin, O.J., **McGuigan, P.M.** & Stokes, K.A. (2019) Exercise Snacking to Improve Muscle Function in Healthy Older Adults: A Pilot Study. *Journal of Aging Research*, vol. 2019, 7516939, pp. 1-9.

Farris, D.J., Trewartha, G., **McGuigan, M.P.** and Lichtwark, G.A. Differential strain patterns of the human Achilles free-tendon and aponeurosis determined in vivo with freehand three-dimensional ultrasound imaging. *J. Exp Biol.* 216, 594-600

Farris, D.J., Trewartha, G. and **McGuigan, M.P.** (2011) The effect of a 30min run on the mechanics of the human Achilles tendon. *Eur. J. Appl. Physiol*. 112, 653-660

Farris, D.J., Trewartha, G. and **McGuigan, M.P**. (2011) Could intra-tendinous hyperthermia during running explain chronic injury of the human Achilles tendon? *J Biomech.* 44, 822-6.

McGuigan, M.P., Yoo, E., Lee, D.V. and Biewener, A.A. (2009) Dynamics of goat distal hind limb muscle-tendon function in response to locomotor grade. *J Exp Biol.* 212, 2092-104.

Lee, D.V., **McGuigan, M.P.**, Yoo,E.H. and Biewener, A.A. (2008) Compliance, actuation, and work characteristics of the goat foreleg and hindleg during level, uphill, and downhill running. *J Appl Physiol.* 104, 130-41.

McGuigan, M.P. and Wilson, A.M. (2003) The effect of gait and digital flexor muscle activation on limb compliance in the forelimb of the horse Equus caballus. *J. Exp. Biol* 206, 1325-36

Wilson, A.M., **McGuigan, M.P**., Su, A., and Bogert, A.J. van den (2001) Horses damp the spring in their step. *Nature* 414, 895-9