
CREATING ATHLETIC MOVEMENT

LOADING STRATEGIES FOR HEALTHY & INJURED TISSUE TO ENHANCE ADAPTATION



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The human body is a highly complex system, and when it comes to movement that is no exception. It requires the careful and precise coordination of a variety of different tissues and their interaction with joints, all of which is regulated by the nervous system. We regularly observe movement and make assessments based on those observations, however, what we do not always know is why we move in certain ways? The human body is a highly complex and adaptive system. This complexity is compounded during movement which requires the careful and precise coordination of a variety of different tissues that interact with joints, all of which is regulated by the nervous system. We regularly observe movement and make assessments based on those observations, however, we are not always able to answer a fundamental question: why do we move in certain ways?

This course will begin to explore the laws of physics around movement, and how different tissues help to regulate that movement. It will go on to explore the immediate response of all tissues (muscles, ligaments, tendons, bone, fascia and joints) to a stressful stimulus, and whether that adaptation will be a positive one or a negative. Rather than focussing on which exercise to do for an injury or problem, the course will improve the candidates ability to understand and make decisions on what change (adaptation) they are trying to get in the subject / patient, and therefore what are all the options available to get that response.

The course will cover all major regions in the body from shoulder, to spinal, to hip & pelvis, knee, and finally ankle-foot. At each region we will explore function in a healthy state and what happens in a pathological state. At each region it will cover a specific principle and look at the best ways to get a positive adaptation at that region. However, every principle explored can be transferred to all the regions and preliminary examples of that will be discussed. The participants, will leave with a clear understanding of the underlying principles of movement and how physics and neurophysiology can interact; they will have a great understanding of when applying an exercise stimulus how to enhance the desired adaptation at that tissue or region; finally, they will leave with key principles that can be applied to all the regions explored.

This is a new course to be established in the UK and Europe in 2019. The course will integrate the theoretical science and research based evidence into bite sized practical application for movement and exercise prescription. It will also draw upon our experiences of working with elite athletes through The English Institute of Sport, UK Athletics, England Rugby, Saracens Rugby, British Triathlon, National teams, The British Olympic Association at various Olympic Games and through the Intensive Rehabilitation Unit for Team GB. Our aim is to provide a platform for effective critical thinking and piece together a framework for good decision making on the application of exercise and load when treating the whole body. We hope you enjoy **Biotensegrity - Loading strategies for tissue and movement to enhance adaptation.**

Regards

James Moore, Tom Rusga

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COURSE DEVELOPED BY:

James Moore - Founder & Tutor

MPhtySt (Manips), MSc Applied Biomechanics, BSc (Hons) Physiotherapy.

CSCS, MMACP, MCSP

James is currently employed by The British Olympic Association (BOA), where he has three roles; Head of Performance for all Olympic Games; manager of The Intensive Rehabilitation Unit (IRU); leading on research to align with the IOC. Concurrently, James is the Sports and Exercise Medicine Director for a private clinic in Harley Street, The Centre for Health & Human Performance (CHHP).

For the XXXII Olympiad Tokyo 2020 James will be The Head of Performance, coordinating & delivering all science and medicine strategies across three main sites. ForThe XXXI Olympiad Rio 2016, James was Deputy Chef de Mission Performance Services for Team GB, where he lead all sports science and sports medicine services in Rio and the Preparation Camp in Belo Horizonte. Team GB created history here, being the first nation to improve their performance at the Olympic Games after previously hosting, and furthermore they had their best ever medal tally in recent times, finishing second. James was Head of Performance for Team GB in the inaugural European Games, Baku 2015.

At the IRU, James leads the team, where their role is to problem solve over any complex cases that are recalcitrant for all Olympic sports, summer or winter, and both Olympians and Paralympian's. In his capacity for the BOA James sits on the strategic board for the Institute of Sport & Exercise Health (ISEH), which is part of the legacy of London 2012 and the National Centre's for Sport & Exercise Medicine (NCSEM). The IOC recently awarded ISEH the honour of being one of nine International Research Centres.

James has previously held positions such as Head of Medical Services at Saracens RFC; Consultant Clinical Lead Physiotherapist to UK Athletics; and Consultant contracted Physiotherapist for the RFU to the Elite Performance Squad; where he worked through two Olympic cycles including London 2012, and helped in the preparation for the Rugby World Cup 2011.

James completed his Bachelors at Kings College London, over 20 years ago now; he qualified as an exercise Physiologist and Certified Strength & Conditioning Specialist (CSCS) in 1998; completed his Masters of Physiotherapy at University of Queensland in 2000; and his Masters of Science (Applied Biomechanics) in 2005 from University of Strathclyde. James has been fascinated by hip mechanics for over 15 years and also loves teaching about lower limb mechanics and injury mechanisms, in particular with a special interest in hamstring injuries and speed development. Recently James has become a PhD candidate at University College London (UCL), under the supervision of Professor Fares Haddad. James will build a mathematical model around the hip to investigate whether muscle force and joint angles have a contribution to function.

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Tom Rusga - Founder & Tutor

PhD (In progress) S&C, BSc(Hons) Sport & Exercise Science, ASCC, ILM Level 7

Tom is currently employed at the English Institute of Sport (EIS) as a Strength & Conditioning Coach and Technical Lead. At present, as a coach, he primarily supports British Rowing athletes whilst also contributing to the design and delivery of the national strength & conditioning strategy at the EIS.

Tom is also currently completing a PhD studying the biomechanics and physical preparation of elite athletes through the lens of contemporary motor control theories. In addition to this, Tom is working towards a Level 7 qualification in Executive Coaching & Mentoring through the Institute of Leadership and Management (ILM). Drawing on his research and applied experience Tom also lectures on several undergraduate and postgraduate physiotherapy, strength & conditioning and sports science courses.

During the Rio Olympic Cycle Tom worked with World Class Programme athletes from GB Hockey and British Athletics. He then worked for Sport Wales as a strength & conditioning coach where he led the sports science and medicine provision to Welsh Boxing and also lead the strength & conditioning for Welsh Cycling. Prior to working with Olympic/Paralympic athletes Tom worked in professional football and has held several research roles both in the UK and abroad working with international federations such as FIFA and World Rugby.

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Day 1

Time	Description
Chapter 1	Introduction & Theory of Creating Athletic Movement
09.15-10.00	Lecture - Applied biomechanics to critical thinking
10.00-10.45	Lecture - Tissue response and adaptation to loading
10.45-11.00	Morning Break
Chapter 2	Creating Athletic Movement @ The Shoulder
11.00-11.30	Lecture - The Paradox of movement: local vs. global, stability vs. mobility
11.30-13.00	Practical - Creating co-ordinated, integrated movement @ the shoulder
13.00-14.00	Lunch
Chapter 3	Creating Athletic Movement @ The Shank, Ankle-foot complex
14.00-15.00	Lecture - Tissue elastic stiffness: muscle vs. tendon vs. bone
15.00-15.15	Afternoon Break
15.15-17.15	Practical - Creating elastic capabilities @ the shank, ankle-foot complex

Day2

Chapter 4	Creating Athletic Movement @ The Knee
09.00-09.45	Lecture - What type of contraction do you want?
09.45-10.45	Practical - Creating forceful movement @ the knee
10.45-11.00	Morning Break
11.00-11.30	Practical - Creating forceful movement @ the knee
Chapter 5	Creating Athletic Movement @ The Spine
11.30-12.15	Lecture - Using fascia and ligaments for movement efficiency
12.15-13.15	Lunch
13.15-14.45	Practical - Creating efficient movement in non-contractile tissue @ the spine
14.45-15.00	Afternoon Break
Chapter 6	Creating Athletic Movement @ The Hip & Pelvis
15.00-15.45	Lecture - How to develop speed / high velocity movements
15.45-17.15	Practical - Creating explosive high speed movement @ the hip

Notes to participants:

The course has a strong practical component so please **bring shorts**.

You will be required to assess and treat and exercise with your fellow participants, but also observe movement, so please make sure you are **appropriately attired**. There is a large **exercise** component to the course, so if you have any limitations please let the Tutor(s) know.