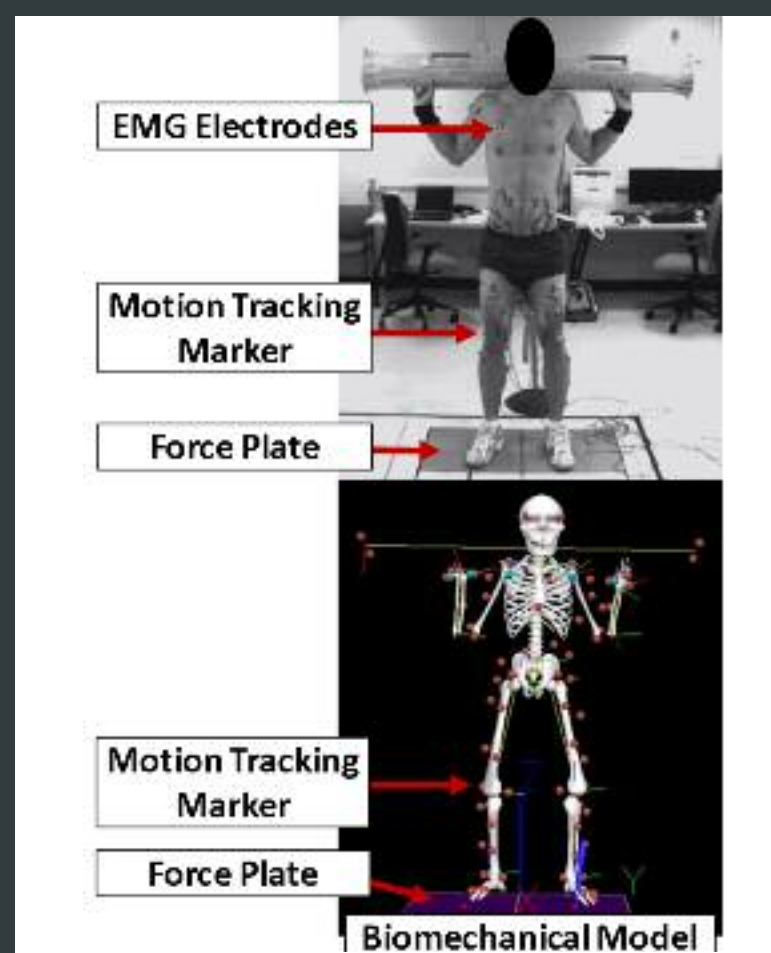


Spine Laboratory – Biomechanics at York

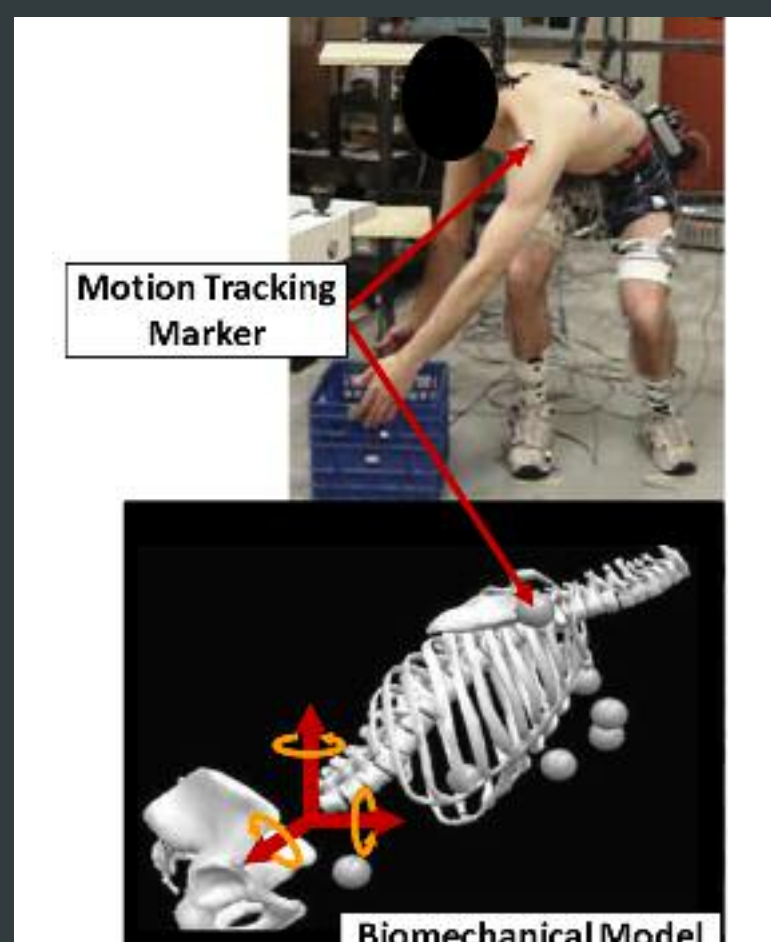
School of Kinesiology and Health Science

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People expose their spines to complex or multi-axis loading on a daily basis, such as getting into or out of a car, swinging a golf club, executing a slap shot, cleaning a washroom, bending forward and twisting to lift an object (e.g., getting a box in a factory or a pan from a cupboard), working on a computer and doing assembly-line work.



The Spine Lab investigates neck, mid-back and low-back spinal responses during both acute and chronic loading. Our research examines how complex loading generates various injury mechanisms and causes pain (e.g., disc herniation, vertebral fracture, nerve compression, etc.). Modifying factors – including task, sex and age – are also examined as these factors affect the spine's mechanics and our neuromuscular control of it.

We use in-vivo 3D motion analyses (kinematics and kinetics), and force and muscle activation recordings. Using these data, we create models that estimate in-vivo tissue loads on bone, muscle and other body parts. Direct measurements of resulting tissue loads are also made using in-vitro tissue testing – which reveals causal mechanisms between back-loading exposures and injury mechanisms – and diagnostic tools such as radiography and MRI.

