

International Conference on Orthopedics and Musculoskeletal Disorders

November 13-14, 2025 | Lisbon, Portugal



David M. Selkowitz, PT, PhD, DPT, OCS

MGH Institute of Health Professions, Boston, MA, USA

Patellofemoral Pain: Hip Muscle Activation and Kinematics with Exercise and External Support

This presentation will focus on selected research questions from my group's line of investigation concerning the effects of exercise and external support on electromyographic activity of hip muscles and hip kinematics in persons with patellofemoral pain (PFP). Excessive hip/femoral internal rotation in weight-bearing is associated with increased lateral patellofemoral joint stress and pain. The tensor fascia lata (TFL) is an abductor but also an internal rotator of the hip. The gluteus medius (GMED) and superior gluteus maximus (SUP_GMAX) are hip abductors, and the SUP-GMAX is also a hip external rotator. Purposes of our research have included comparing the EMG activity of these hip muscles between persons with and without PFP and the effects of external support on pain and hip rotation in persons with PFP. We have assessed, during selected therapeutic exercises, the EMG of these hip muscles using fine-wire electrodes in persons with and without PFP, and hip rotation using 3-D kinematics in persons with PFP while wearing and not wearing the SERF Strap, a brace designed to limit hip internal rotation. Persons with PFP demonstrated increased TFL activation and decreased activation of these gluteal muscles during therapeutic exercises, except for the clam exercise. The SERF Strap decreased knee pain and hip internal rotation in persons with PFP. These results impact clinical strategies for exercise and bracing of the hip and knee for persons with PFP.

Keywords

patellofemoral pain, hip, exercise, electromyography

Biography

Dr. Selkowitz has been on university faculty for over 30 years, having taught evaluation and management of musculoskeletal dysfunction, electrotherapy, and research. His clinical experience in orthopedic physical therapy spans over 40 years. He has presented at numerous professional conferences, workshops, and continuing education courses, from local to international venues, and published book chapters and articles in peer-reviewed journals on musculoskeletal function and dysfunction and electrotherapy. He served 3 consecutive terms on the executive council of the International Society of Electrophysiology and Kinesiology. Dr. Selkowitz has been honored with the Faculty Publication Award by the California Physical Therapy Association (CPTA) and Best Research Platform Presentation Award at the CPTA annual conference.