Ongoing Clinical Trials

- **Moderated Blood Flow Restriction After Anterior Cruciate Ligament Reconstruction**  
  *University of Missouri-Columbia*  
  The aim of this study is to determine if there is a difference in post operative rehabilitation after anterior cruciate ligament (ACL) reconstruction surgery while using moderated blood flow therapy vs. standard physical therapy. All patients undergoing ACL reconstruction, between the ages of 18-30, that consent to taking part in the study, and meet eligibility criteria, will be included in the study. Patients will be followed for two years to determine any differences in muscle strength, thigh circumference, knee range of motion, pain, functional and activity levels, patient satisfaction, levels of Human growth hormone HGH), Insulin-like Growth Factor (IGF), and Creatine Kinase (CK), KT2000, and Lachman physical examination.

- **Blood Flow Restriction Training to Improve Muscle Strength and Function Following Anterior Cruciate Ligament Injury**  
  *University of Michigan*  
  Quadriceps muscle weakness is a common consequence following anterior cruciate ligament (ACL) injury and reconstruction. Maximizing quadriceps strength following ACL injury is significant as diminished quadriceps strength has been linked to the osteoarthritis that affects over 50% of surgically reconstructed limbs. Given that knee joint health following ACL injury is predicated on restoring quadriceps strength, identifying treatment approaches capable of improving strength is paramount. Blood flow restriction training (BFRT) is a method where oxygen to the muscle is intentionally reduced during exercise/rehabilitation and may lead to more timely and substantial strength gains. In the proposed project, we will examine the efficacy of BFRT in patients who have undergone ACL reconstruction and suffer from substantial quadriceps weakness.

- **Does Blood Flow Restriction Training Improve Quadriceps Function After Arthroscopic Knee Surgery? A Randomized Clinical Trial**  
  *The University of Texas Health Science Center, Houston*  
  The purpose of this study is to evaluate the effectiveness of physical therapy (PT) plus BFR training compared to PT alone (without BFR training) after ACL reconstruction in patients who require extended limited weight bearing through assessment of patient reported outcomes and functional testing. The hypothesis is that PT plus BFR training will mitigate the loss of quadriceps muscle cross-sectional area, strength, and function while also improving early clinical and functional results.

- **Blood Flow Restriction Training Versus Standard Physical Therapy in Post-Operative and Post-Traumatic Rehabilitation Patients**  
  *Brooke Army Medical Center*  
  Occlusion training, resistance exercise performed with a specialized venous tourniquet, leads to beneficial changes in muscle at low resistance and minimal stress on the nearby joint. This novel resistance training has the potential to greatly improve extremity muscle strength gains for rehabilitation patients who are unable for medical reasons to perform high resistance exercise. Our study will explore this with specific rehabilitation populations: post-operative knee scopes, post-operative anterior cruciate ligament (ACL) reconstruction patients who have acute post-operative changes in thigh muscle function and chronic thigh weakness. The primary outcome is to achieve accelerated functional thigh recovery with outcome measures including thigh strength, validated questionnaires, and validated functional testing. Occlusion training can enhance rehab patients outcomes, reduce the cost of care, and improve the skills and efficiency of care providers.
• The Effect of Blood Flow Restriction Training on Muscle Atrophy Following Knee Surgery; A Randomized Control Trial  

  Keller Army Community Hospital

  The investigators will compare differences in quadriceps strength, leg girth, and functional outcome scores between two groups of patients after weeks 6 and 12 as well as 6 months following meniscus or articular cartilage repair/ restoration requiring 6 weeks of non-weight bearing or limited weight bearing status in a brace at 0° degrees of knee extension. One group will receive BFR with standard post-operative rehabilitation for 12 weeks followed by the standard protocol progression for the remainder of the treatment program. The other group will receive standard post-operative rehabilitation without BFR for the duration of treatment program.

• REPAIR: Rehabilitation Enhanced by Partial Arterial Inflow Restrictions  

  Major Extremity Trauma Research Consortium (7 Trauma Centers)

  The Rehabilitation Enhanced by Partial Arterial Inflow Restriction (REPAIR) Study will be conducted in a patient population of individuals recovering from a traumatic diaphyseal fracture of the femur. Although the intervention can be used for any patient with muscle weakness following trauma, the persistent thigh weakness that follows a femur fracture provides a perfect model for evaluating the effectiveness of the REPAIR protocol.

• Blood Flow Restriction Training Following Primary Total Knee Arthroplasty  

  San Antonio Military Medical Center

  This study will evaluate blood flow restriction training as a rehabilitation modalities following total knee arthroplasty in order to determine if patient reported outcomes and objective functional outcomes can be improved through post-operative rehabilitation compared to standard physical therapy modalities currently in use.

• BFR DISTRAD: Blood Flow Restricted Training During Rehabilitation Following Distal Radius Fracture Repair  

  Brooke Army Medical Center

  Occlusion training, resistance exercise performed with a specialized venous tourniquet, leads to beneficial changes in muscle strength at low resistance and minimal stress on the nearby joint. This novel resistance training has the potential to greatly improve muscle strength gains in individuals who are unable, for medical reasons, to perform the high resistance exercises typically required to improve strength. Our study will examine the effect of this technique on strength recovery following distal radius fracture repair. The primary objective of the intervention is to achieve accelerated recovery of forearm, wrist and hand function as assessed using measures such as grip/pinch strength, validated questionnaires, and functional outcome testing. Occlusion training can potentially serve as a specialty intervention for rehabilitation patients, reduce the cost of care, and improve the treatment options for both patients and providers.

• Additional ACL studies  

  Methodist, Houston  
  St. Mary’s, United Kingdom  
  Beaumont Healthcare, Detroit

• Achilles Tendinopathy, Ft. Bragg

• Ankle Fractures, St. Mary’s, United Kingdom

• CV Risk Factors, University of Miami

• Chronic Thigh Weakness After Surgery, DOD