High intensity functional movement (HIFM) protocol improves movement patterns and work capacity in an offensive lineman/USMC veteran with an arm length discrepancy.


**Background:** 25 year old male, US marine corps veteran and NCAA D2 college football player with diagnosed mechanical imbalances of the upper and lower body. Pathologies include right shoulder impingement syndrome and tendonitis of the distal head of the bicep, left knee patellar tendonitis and right leg hip flexor tendonopathy. Patient served 6 years active duty prior to participation in college football. Prior history of humeral fracture involving the growth plate, resulted in 1 1/2 inch greater right arm length when compared to left. A 95lb weight gain over past 2 years was observed. **Differential Diagnosis:** Upper extremity pathologies: impingement syndrome, Labral tear, Rotator cuff strain, Erb’s Palsy, chronic regional pain syndrome. Lower body pathologies: chronic regional pain syndrome, quadriceps tendonitis, proximal quadriceps strain, labral tear and bursitis.

**Treatment:** A 6 week high intensity functional movement (HIFM) protocol was prescribed for this patient 1 month after spring practice ended. Four consecutive, 90min workouts were completed weekly (M-Th) followed by one day of rest and two days of active recovery. Workouts structured as follows: foam roll (10min), stretch (10min), dynamic warm-up (20min); technique work (20min), metabolic conditioning (20min), and static stretches (10min). Initial technique work focused on core stability, scapular muscle endurance transitioning into movement proficiency with total body exercises: Turkish get-ups, over-head squats, thrusters, single-leg squats, inverted rows and single-arm dumbbell snatch. Metabolic conditioning was anaerobic, maximal exertion bouts lasting between 8 and 20minutes and included measureable tasks like weighted wall balls for time, 20 min AMRAP, EMOM, and TABATA style workouts. Static power band stretches, held for a :45 sec count targeting lower extremity flexibility and shoulder mobility completed each workout. **Uniqueness:** HIFM exercise helped dramatically improve the overall work capacity and movement proficiency for this patient as measured by anaerobic strength endurance task (timed wall balls) and the functional movement screen (FMS). Many service men and women experience a difficult transition back to civilian life, and participation in a team sports might ease this transition. Being prepared physically and mentally for battle does not translate well for maintaining life-long healthy lifestyles. This intervention was successful in improving this patient's physical work capacity which in previous years might have been hindered by training for hypertrophy. **Conclusions:** Athletic Trainers must be prepared to treat patients who are transitioning back to civilian life after careers in the armed forces. People exposed to extremely stressful events are at a higher risk for developing post-traumatic stress (PTS). Research on US war veterans shows those suffering with (PTS) experience a lower quality of life, poorer mental and physical health. These patients have a greater need to adopt healthy lifestyle behaviors. In this case traditional hypertrophy training provided an increased opportunity for this patient to load an inefficient movement pattern exacerbated by an arm length discrepancy and repeated sub maximal repetitions. A more functional, high intensity core to extremity approach allowed muscular adaptation through explosive single arm and leg movements which improved balance, core stability and overall work capacity. **Relevant Evidence:** Pre and post conditioning data showed a 4 minute improvement in 100 rep wall ball assessment, FMS data shows a 6 point improvement in FMS composite scores (15/21). A 57% reduction in treatments requiring modalities (42/24) was found when comparing treatment frequency data between 2014 and 2015. Initial DPAS scores were: 39 (2013), following traditional treatment 33 (2014); and in-season s/p HIFM training 18 (2015). DPASS MCID for chronic injuries is 6. Pre intervention pain at worst was reported at 6/10, pain at best was 2/10. Post intervention pain at worst was 1/10, pain at best was 0/10. **Word Count:** 594