Preventing Thoracic Outlet Syndrome in High School Baseball and Softball Athletes: A Model for Occupational Therapy Clinical Practice  
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In The Ball Park
- Thoracic outlet syndrome is a diagnosis affecting the muscles, nerves and vasculature of the upper extremity
- Symptoms: heaviness or weakness of the upper extremity, easy fatigability, pain in the upper extremity, face or posterior shoulder, swelling, color changes of the upper extremity, numbness, and paraesthesias or complete sensation loss in the affected extremity

A Swing And A Miss
- Since 2001, five major league pitchers from one team have been diagnosed with TOS
- Athletes can go undiagnosed for years while their skill declines due to compression of the brachial plexus or vasculature in the upper extremity
- Research shows coaches and teammates encourage athletes to ignore pain and injury
  - Athletes often “play through” symptoms to stay in the game
- Strengthening programs for athletes are often inadequate in prevention of imbalance of the shoulder girdle
  - Coaches and trainers tend to ignore stabilizers of the upper extremity
- Coaches and trainers often lose site of the fact that these athletes are not fully-grown

Self Determination Theory, Deci & Ryan (1985)
- Individuals strive for competence, autonomy and relatedness which drives the degree of motivation or influence their decision to play through pain

Social Action Theory, Weber (1978)
- Social structures direct, define human behavior and are bureaucratic or institutional in nature
- Individuals carry out social actions to reach the goals of the bureaucracy or institution (the baseball or softball team), leading to playing through pain
The Pitch

• Pre-season
  o Quiz to coaches and athletes on understanding of overuse injuries and motivations role
  o For the first two weeks OT presence during practices along side coaching staff
  o Exercises completed at the start of each practice, set up in four stations in the gym:
    § Strengthening of scapular stabilizers
    § Core strengthening to provide stability through the kinematic chain
    § Overall fitness: endurance training, weight training
    § Stretching to reduce the effects of hypertrophied muscles on peripheral nerves
  o Issue a home exercise program (HEP) to carryover scapular and core stability exercises at home on non-practice days to establish scapular and core stability prior to the start of the regular season
  o Education to coaches and athletes in a presentation at the beginning of the first practice with written material as a reference regarding:
    § Signs of upper extremity overuse
    § How to stay safe during training
    § How motivation can lead to overuse injuries

• In-Season
  o One time per week OT presence during practice for oversight of positioning during skills training and for consultation with athletes/coaches as needed
  o Continuation of the HEP issued during the pre-season in addition to daily team practices

• Post-season
  o Repeat quiz on understanding of overuse injuries and motivations role

The Delivery

• Group practice instruction
• Written material
• Internet website with multimedia links for exercise and educational instruction
• Free App for athletes containing the strengthening and stretching exercises by area of the body

The Lineup


Zaremski, J.L & Krabak, B.J. (2012). Shoulder injuries in the skeletally immature baseball pitcher and