

SHOULDER INTERNAL IMPINGEMENT NON-OPERATIVE GUIDELINES

The following shoulder internal impingement guidelines were developed by HSS Rehabilitation and are categorized into five phases with the goal of returning the athlete to full competition. Classification and progression are both criteria-based and time based due to the healing constraints of the human body. The first phase is focused on the acute recovery period and healing. Phases two and three are focused on building foundational strength and stability which will allow the patient to progress to phase four which includes plyometric exercises. With the completion of phase four the athlete will be able to start the final phase which includes interval sports programs. The clinician should use their skilled judgement and decision making as the athlete advances, as all progression may not be linear and may take longer than the time frames indicated.

FOLLOW PHYSICIAN'S MODIFICATIONS AS PRESCRIBED

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Phase 1: Acute Phase (Weeks 0-2)

PRECAUTIONS

- Avoid pain provoking activities
- Avoid any painful exercises

ASSESSMENT

- Quick Disabilities of Arm, Shoulder & Hand (Quick DASH)
- Numeric Pain Rating Scale (NPRS)
- Posture
- Cervical mobility
- Thoracic mobility
- Scapular Assessment
- Shoulder range of motion (ROM): 90/90 internal rotation, horizontal adduction
- Elbow passive range of motion (PROM)/active range of motion (AROM)
- Hand and wrist AROM
- Kinetic chain assessment

TREATMENT RECOMMENDATIONS

- Shoulder flexibility
 - Modified sleeper stretch
 - Cross body stretch
- Strengthening
 - Rotator cuff (RC) exercise below 90°
 - Concentric and eccentric
 - Sidelying external rotation (ER)
 - Row with scapular protraction and retraction
 - Kibler exercises
- Scapular stabilization
 - Prone row
 - Prone extension
 - Prone horizontal abduction
 - Closed kinetic chain (CKC) quadruped protraction
 - CKC wall scapula press for endurance
 - Dynamic hug supine resistance band
- Modalities: cryotherapy, laser, electric stimulation, compression therapy

CRITERIA FOR ADVANCEMENT

- No pain at rest
- Full shoulder ROM

EMPHASIZE

- Reduction of pain and inflammation
- Restoration of shoulder ROM
- Restoration of posterior flexibility

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Phase 2: Sub-acute Phase (Weeks 3-4)

PRECAUTIONS

- Maintain pain-free ROM
- Avoid any painful exercises

ASSESSMENT

- Quick DASH
- NPRS
- Posture
- Cervical mobility
- Thoracic mobility
- Scapular Assessment
- Shoulder PROM/AROM
- Elbow PROM/AROM
- Hand and wrist AROM
- Kinetic chain assessment

TREATMENT RECOMMENDATIONS

- Continue above treatment recommendations
- Flexibility: Sleeper and cross body stretches
 - Caution not to progress beyond normal total arc of motion
- Advance RC strengthening to 90/90 position
- Proprioceptive neuromuscular facilitation (PNF) diagonals
- Sidelying ER in side plank
- Scapular stabilization
 - CKC quad single arm protraction → unstable surface → perturbations
 - Wall slide with low trap lift off
 - Dynamic hug CKC
 - Prone T, W, Y, I
- End range stabilization using exercise blade/perturbations
- Core strength/kinetic linking
- Double arm plyometric
- Lower extremity (LE) strengthening

CRITERIA FOR ADVANCEMENT

- Tolerance of Phase 2 exercises without posterior shoulder discomfort
- Tolerance of double arm plyometrics without discomfort

EMPHASIZE

- Progression of RC and scapular strength
- Restoration of shoulder endurance in 90/90 position
- Improved neuromuscular control

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Phase 3: Advanced (Weeks 5-6)

PRECAUTIONS

- Follow functional progression

ASSESSMENT

- Quick DASH
- NPRS
- Posture
- Cervical mobility
- Thoracic mobility
- Scapular Assessment
- Distal mobility
- Kinetic chain assessment

TREATMENT RECOMMENDATIONS

- Continue stretching as above
- Foam roller/trigger point ball as needed
- Continue all shoulder exercises as above
- Progress neuromuscular stabilization
 - Perturbations at end range ER 90/90
 - Wall ball stabilization with perturbations
- Plyometric progression
 - Double arm plyometrics → single arm plyometrics → 90/90 plyometrics
 - 90/90 wall dribble
 - Eccentric catches
- Progress scapular/serratus activation
 - Push up plus into ball against wall
 - Yoga push-up
 - Landmine press
 - “Plus” in plank position → unstable surface → perturbations
- Towel drill
 - If an overhead athlete can hold a towel and move the arm through a throwing path as if throwing a baseball

CRITERIA FOR ADVANCEMENT

- Single arm plyometrics without discomfort
- Towel drill without discomfort

EMPHASIZE

- Advancement to plyometric and sports specific movements
- Progression of RC and scapular strength and endurance

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Phase 4: Return Sport Progression (Weeks 7-12+)

PRECAUTIONS

- All progressions should be pain-free
- Monitor for loss of strength and flexibility

ASSESSMENT

- Quick DASH
- NPRS
- Posture
- Scar and soft tissue mobility
- Elbow PROM/AROM
- Hand and wrist AROM
- Scapula assessment: position, rhythm
- Shoulder strength assessment: consider IR/ER ratio
- Posterior shoulder endurance test

TREATMENT RECOMMENDATIONS

- Initiate interval sports program
 - Monitor mechanics and workload
- Throwers Ten Exercises
- Initiate hitting program if appropriate
- Continue with all upper and lower extremity mobility/flexibility exercises
- Continue with advanced shoulder and scapular strengthening exercises
- Collaborate with ATC, performance coach/strength and conditioning coach, skills coach and/or personal trainer to monitor load and volume with return to sport participation

CRITERIA FOR ADVANCEMENT

- Pain-free progression through interval sports program
- Independent with all arm care exercises
- Assess need for HSS Video Throwing Analysis program

EMPHASIZE

- Initiation of interval sports programs
- Return to sport participation
- Collaboration with Sports Performance experts

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References

1. Dines JS, Frank JB, Akerman M, Yocum LA. Glenohumeral internal rotation deficits in baseball players with ulnar collateral ligament insufficiency. *Am J Sports Med.* 2009;37(3):566-570. doi:10.1177/0363546508326712.
2. Heyworth BE, Williams RJ. Internal impingement of the shoulder. *Am J Sports Med.* 2009;37(5):1024-1037. doi:10.1177/0363546508324966.
3. Hinton RY. Isokinetic evaluation of shoulder rotational strength in high school baseball pitchers. *Am J Sport Med.* 1988;16(3):274-279.
4. Ludewig PM, Cook TM. Translations of the humerus in persons with shoulder impingement symptoms. *J Orthop Sport Phys Ther.* 2002;32(6):248-260.
5. Mihata T, Gates J, McGarry MH, Lee J, Kinoshita M, Lee TQ. Effect of rotator cuff muscle imbalance on forceful internal impingement and peel-back of the superior labrum: A cadaveric study. *Am J Sports Med.* 2009;37(11):2222-2227. doi:10.1177/0363546509337450.
6. Mihata T, McGarry MH, Neo M, Ohue M, Lee TQ. Effect of anterior capsular laxity on horizontal abduction and forceful internal impingement in a cadaveric model of the throwing shoulder. *Am J Sports Med.* 2015;43(7):1758-1763. doi:10.1177/0363546515582025.
7. Myers JB, Laudner KG, Pasquale MR, Bradley JP, Lephart SM. Glenohumeral range of motion deficits and posterior shoulder tightness in throwers with pathologic internal impingement. *Am J Sports Med.* 2006;34(3):385-391. doi:10.1177/0363546505281804.
8. Reinold MM, Wilk KE, Macrina LC, et al. Changes in shoulder and elbow passive range of motion after pitching in professional baseball players. *Am J Sports Med.* 2008;36(3):523-527. doi:10.1177/0363546507308935.
9. Wilk KE, Hooks TR, Macrina LC. The modified sleeper stretch and modified cross-body stretch to increase shoulder internal rotation range of motion in the overhead throwing athlete. *J Orthop Sports Phys Ther.* 2013;43(12):891-894. doi:10.2519/jospt.2013.4990.
10. Wilk KE, Obma P, Simpson CD, Cain EL, Dugas JR, Andrews JR. Shoulder injuries in the overhead athlete. *J Orthop Sports Phys Ther.* 2009;39(2):38-54. doi:10.2519/jospt.2009.2929.

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