Shoulder Rehabilitation

See also Shoulder Exam in Athletes

Philosophy and Goals of Rehabilitation

1. Restore pain-free full ROM and flexibility
2. Achieve muscle balance, endurance, strength
3. Restore function
4. Maintain mental well being, desire to return to health
5. Rehab incl
    - Physician
    - Physical therapist
    - Certified athletic trainer
    - Pt/ family

Locations for Rehabilitation

1. At home
    - Handouts
        - AAFP Handouts online
            - http://familydoctor.org/online/famdocen/home/healthy/physical/injuries/268.html
        - The Sports Medicine Patient Advisor-book with handouts
2. Physical therapy
    - Individualized therapy programs
        - Monitored exercises
3. Certified athletic trainer
    - Sport specific rehabilitation
        - Return to sport or activity

Shoulder Rehabilitation Plan

1. Acute Phase:
    - Pain reduction
        - Pain medication as indicated
    - Inflammation control
        - NSAIDs
            - Some limited evidence supporting the use of NSAIDs in initial treatment of shoulder pain
        - Therapeutic modalities
            - Cryotherapy
                - 24-48 hrs post injury
                - Ice pack 15-20 mins
                - Ice massage 12 mins
            - Moist heat: to assist warm-up
            - U/S
                - Incr joint mobility
                - Decr scaring and joint adhesions
                - Deliver local meds w/phonophoresis
            - Electrical stimulation
        - Steroid injections
            - Triamcinolone

        - Dexamethasone
        - Methylprednisolone
    - Protection acutely
        - (1-2 days max)
        - Shoulder sling
        - Shoulder immobilizer
    - Gentle passive ROM
        - Pendulum exercises: bending over allows arm to swing in all planes
        - Passive pulley: use uninjured arm to raise affected arm
    - Isometric strengthening
        - Stabilize glenohumeral joint
        - Flex elbow to 90°
        - Stand in doorway
        - Hold each for 15-30 secs (10 reps x3 sets)
            - Abduction
            - Internal rotation
            - External rotation
2. Sub-Acute Phase
    - (Days 3-7 post-injury)
    - ROM
        - Active assisted ROM
            - Wand exercises (stick held in both hands)
            - Rope and pulley
            - Wall walking (walking fingers up wall)
        - Capsule stretching
            - Cross shoulder in front of chest
            - Internal and external rotation using doorframe
        - Rotator cuff
            - Assisted horizontal adduction
            - Assisted flexion
            - Supine internal and external rotation
        - Large muscle groups
            - Latissimus dorsi
            - Deltoid
    - Strength
        - Equipment
            - Resistance tubing
            - Dumbbells
            - Water exercises
        - Muscles
            - Scapula: critical to strengthen
                - Retraction: push-ups
                - Protraction: push-ups w/plus
                    - Extra protraction at end of press
                - Elevation: low row
            - Rotator cuff
                - Empty can: diagonal plane between abduction and flexion w/thumb pointing down
                - Full can: diagonal plane w/thumb point up

        - Internal rotation, external rotation
            - Resistance tubing
            - Dumbbells
        - Trapezius (lower muscle fibers)
            - Bent over rows
        - Deltoid
            - Military shoulder press (in front of head)
            - Dumbbell raises
    - Muscle balance
        - Internal rotation, external rotation (ER at least 65% as strong as IR)
        - Lower extremity and upper extremity
            - Strength training for lower extremity
    - Muscle endurance
        - Repetitive movements
        - Cardiovascular training
            - Upper body ergometer (arm bike)
            - Stationary bike
    - Dynamic stability
        - Proprioceptive Neuromuscular Facilitation (PNF)
            - Slow reversal hold patterns w/therapist
3. Advanced Strengthening Phase
    - (Beginning day 7 post-injury as tolerated)
    - Continued strengthening
        - Continued isotonic exercises
            - Military shoulder press (in front of head)
            - Bench press
        - Isokinetic machines
            - Wt vs. time
    - Progressive neuromuscular control
        - Rhythmic stabilization
        - Reciprocal isometrics
    - Proprioception training
        - Wt shifts on hands and knees
            - Example: While in quadruped position alternate raising opposite upper/lower extremity while maintaining balance
        - Wt shifts on ball or balance board
            - Example: Shifting wt while maintaining balance on non-level surface
    - Plyometric training
        - Two handed chest passing of medicine ball
        - Two handed overhead throwing of medicine ball
        - Side throwing
        - One arm throwing into trampoline
    - Simulated throwing
        - Mirror throwing
            - Mimicking throwing by watching in mirror
        - Light tossing
            - Non-weighted ball short distance
4. Return to function

- Activity of daily living
- Activity-specific exercises
- Occupational activities
- Throwing progression (baseball, softball)
  - Throwing interval
- Criteria to return to sport
  - Full ROM
  - Pain and swelling resolved
    - 70% shoulder strength to run
      - Shearing forces transmitted through shoulder
    - 90% shoulder strength to return to agilities or sport

Overhead Interval Throwing Program

1. Warm-up w/short tosses (10-15 feet)
2. Long-toss interval phases
   - Phase 1:
     - 25 throws at 90 feet
   - Phase 2:
     - 25 throws at 120 feet
   - Phase 3:
     - 25 throws at 150 feet
   - Phase 4:
     - 25 throws at 180 feet
   - Phase 5:
     - 25 throws at 210 feet
   - Phase 6:
     - 25 throws at 240 feet
3. Short-toss interval
   - Phase 1:
     - 50 ½ speed, straight pitches on flat ground at 30 feet
   - Phase 2:
     - 50 ½ speed, straight pitches on flat ground at 60 feet
   - Phase 3:
     - 50 ¾ speed, straight pitches on flat ground at 60 feet
   - Phase 4:
     - 50 ¾ speed, straight pitches off mound at 60 feet
   - Phase 5:
     - 50 ½ - ¾ speed, breaking pitches off mound at 60 feet
   - Phase 6:
     - 50 ¾ full speed, all pitches off mound at 60+ feet
4. Rest 10-30 mins
5. Repeat warm-up
6. Repeat long-toss interval
7. Repeat short-toss interval
8. Cool down
9. Progression specifics
   - Throwing should occur daily
   - Each throwing phase should be completed in 5 mins
   - Proceed to subsequent phase if complete and pain-free

- Progress to subsequent phase once completed current phase goals
- If soreness or stiffness develops and persists, next throwing sessions should be reduced or skipped

Evidence-Based Inquiry

1. Does injection of steroids and lidocaine in the shoulder relieve bursitis?
2. What is the initial approach to the treatment of shoulder pain?

References

1. Canavan PK: Rehabilitation in Sports Medicine, a Comprehensive Guide. Stamford, CT, Appelton & Lange, 1998, 173-228
2. Kibler WB: Shoulder Rehabilitation: Principles and Practices. Medicine & Science in Sports & Exercise 30 (4): S40-S50, 1998
3. Kibler WB, McMullen J, Uhl T: Repair of Athletic Shoulder Injuries. Orthopedic Clinics of North America 32(3), 2001
4. Mellion MB, Walsh, WM, et al: Team Physician's Handbook, 3rd Edition. Philadelphia, PA, Hanley & Belfus, Inc., 2002, 645
5. Puffer JC: 20 Common Problems in Sports Medicine. New York, NY, McGraw-Hill, 2002, 23-27
6. Rouzier P: The Sports Medicine Patient Advisor. Second edition. Amherst, MA, McKesson Health Solutions LLC, 2004, 20-41
7. Stracciolini A, Meehan WP, d'Hemecourt PA: Sports Rehabilitation of the Injuries Athlete. Clinical Pediatric Emergency Medicine 8(1), 2007
8. Walton J, Paxinos A, et al: The Unstable Shoulder in the Adolescent Athlete. The American Journal of Sports Medicine 30(5): 728-767, 2002
9. Wilk KE, Meister K, Andrews JR: Current Concepts in the Rehabilitation of the Overhead Throwing Athlete. The American Journal of Sports Medicine 30(1): 136-151, 2002

Authors: Bradley Sandella, DO, ATC, & Tony S. Reed, MD, *Christina Care Health Services, Wilmington, DE*

Editor: Carol Scott, MD, *University of Nevada Reno FPRP*