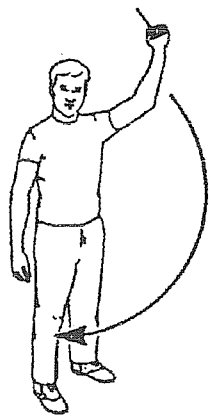
Throwers Ten Exercise Program

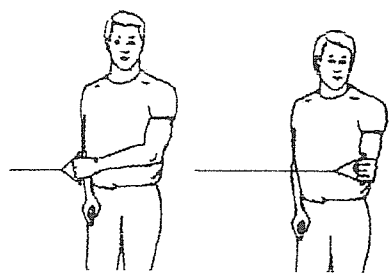
The Thrower's Ten Program is designed to exercise the major muscles necessary for throwing. The Program's goal is to be an organized and concise exercise program. In addition, all exercises included are specific to the thrower and are designed to improve strength, power and endurance of the shoulder complex musculature.

1A. **Diagonal Pattern D2 Extension:** Involved hand will grip tubing handle overhead and out to the side. Pull tubing down and across your body to the opposite side of leg. During the motion, lead with your thumb. Perform _____ sets of _____ repetitions _____ daily.

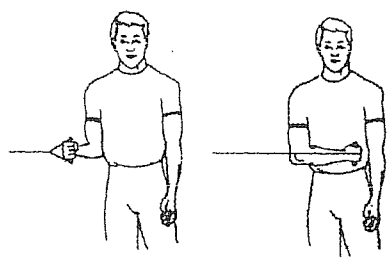


1B. **Diagonal Pattern D2 Flexion:** Gripping tubing handle in hand of involved arm, begin with arm out from side 45° and palm facing backward. After turning palm forward, proceed to flex elbow and bring arm up and over involved shoulder. Turn palm down and reverse to take arm to starting position. Exercise should be performed _____ sets of _____ repetitions _____ daily.

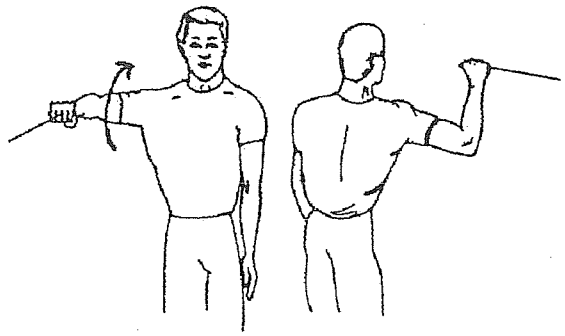
2A. **External Rotation at 0° Abduction:** Stand with involved elbow fixed at side, elbow at 90° and involved arm across front of body. Grip tubing handle while the other end of tubing is fixed. Pull out arm, keeping elbow at side. Return tubing slowly and controlled. Perform _____ sets of _____ repetitions _____ times daily.



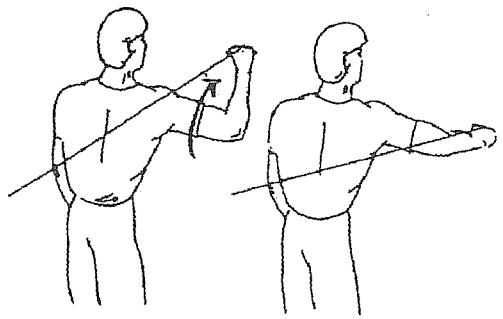
2B. **Internal Rotation at 0° Abduction:** Standing with elbow at side fixed at 90° and shoulder rotated out. Grip tubing handle while other end of tubing is fixed. Pull arm across body keeping elbow at side. Return tubing slowly and controlled. Perform _____ sets of _____repetitions _____ times daily.



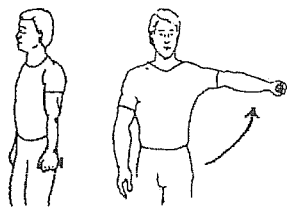
2C. (Optional) **External Rotation at 90° Abduction:** Stand with shoulder abducted 90°. Grip tubing handle while the other end is fixed straight ahead, slightly lower than the shoulder. Keeping shoulder abducted, rotate shoulder back keeping elbow at 90°. Return tubing and hand to start position.
I. Slow Speed Sets: (Slow and Controlled) Perform _____ sets of _____ repetitions _____ times daily.
II. Fast Speed Sets: Perform _____ sets of _____ repetitions _____ times daily.



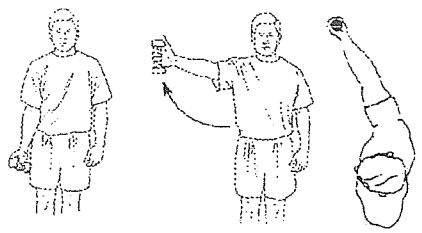
2D. (Optional) **Internal Rotation at 90° Abduction:** Stand with shoulder abducted to 90°, externally rotated 90° and elbow bent to 90°. Keeping shoulder abducted, rotate shoulder forward, keeping elbow bent at 90°. Return tubing and hand to start position.
I. Slow Speed Sets: (Slow and Controlled) Perform _____ sets of _____ repetitions _____ times daily.
II. Fast Speed Sets: Perform _____ sets of _____ repetitions _____ times daily.



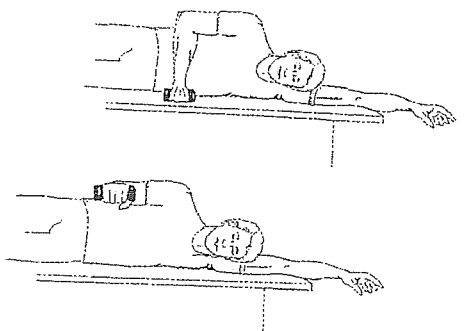
3. **Shoulder Abduction to 90°:** Stand with arm at side, elbow straight, and palm against side. Raise arm to the side, palm down, until arm reaches 90° (shoulder level). Perform _____ sets of _____ repetitions _____ times daily.



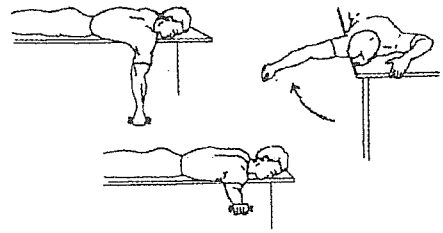
4. **Scaption, External Rotation:** Stand with elbow straight and thumb up. Raise arm to shoulder level at 30° angle in front of body. Do not go above shoulder height. Hold 2 seconds and lower slowly. Perform _____ sets of _____ repetitions _____ times daily.



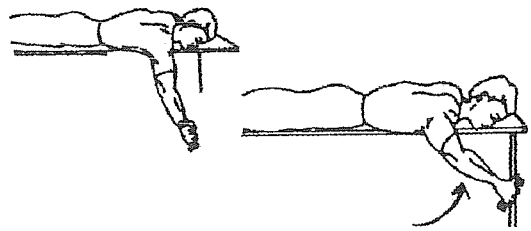
5. **Sidelying External Rotation:** Lie on uninvolved side, with involved arm at side of body and elbow bent to 90°. Keeping the elbow of involved arm fixed to side, raise arm. Hold seconds and lower slowly. Perform _____ sets of _____ repetitions _____ times daily.



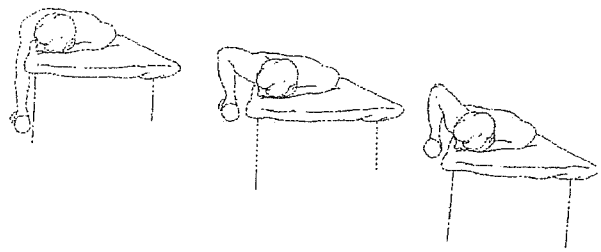
6A. **Prone Horizontal Abduction (Neutral):** Lie on table, face down, with involved arm hanging straight to the floor, and palm facing down. Raise arm out to the side, parallel to the floor. Hold 2 seconds and lower slowly. Perform _____ sets of _____ repetitions _____ times daily.



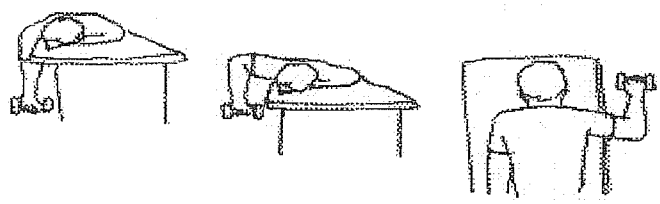
6B. **Prone Horizontal Abduction (Full ER, 100° ABD):** Lie on table face down, with involved arm hanging straight to the floor, and thumb rotated up (hitchhiker). Raise arm out to the side with arm slightly in front of shoulder, parallel to the floor. Hold 2 seconds and lower slowly. Perform _____ sets of _____ repetitions _____ times daily.



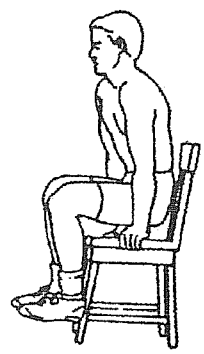
6C. **Prone Rowing:** Lying on your stomach with your involved arm hanging over the side of the table, dumbbell in hand and elbow straight. Slowly raise arm, bending elbow, and bring dumbbell as high as possible. Hold at the top for 2 seconds, then slowly lower. Perform _____ sets of _____ repetitions _____ times daily.



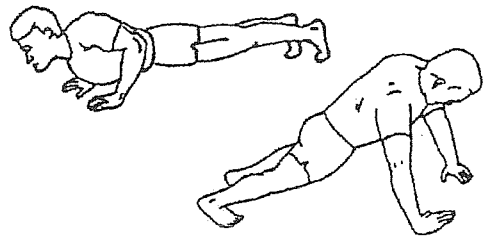
6D. **Prone Rowing into External Rotation:** Lying on your stomach with your involved arm hanging over the side of the table, dumbbell in hand and elbow straight. Slowly raise arm, bending elbow, up to the level of the table. Pause one second. Then rotate shoulder upward until dumbbell is even with the table, keeping elbow at 90°. Hold at the top for 2 seconds, then slowly lower taking 2 – 3 seconds. Perform _____ sets of _____ repetitions _____ times daily.



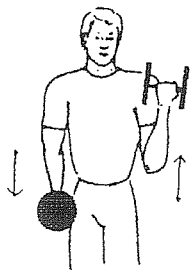
7. **Press-ups:** Seated on a chair or table, place both hands firmly on the sides of the chair or table, palm down and fingers pointed outward. Hands should be placed equal with shoulders. Slowly push downward through the hands to elevate your body. Hold the elevated position for 2 seconds and lower body slowly. Perform _____ sets of _____ repetitions _____ times daily.



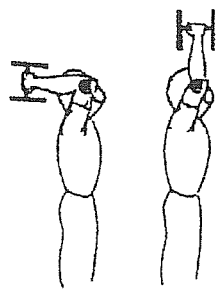
8. **Push-ups:** Start in the down position with arms in a comfortable position. Place hands no more than shoulder width apart. Push up as high as possible, rolling shoulders forward after elbows are straight. Start with a push-up into wall. Gradually progress to table top and eventually to floor as tolerable. Perform _____ sets of _____ repetitions _____ times daily.



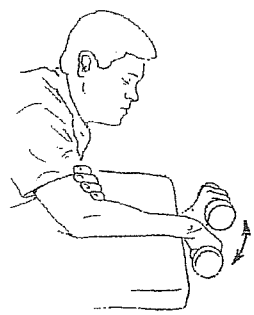
9A. **Elbow Flexion:** Standing with arm against side and palm facing inward, bend elbow upward turning palm up as you progress. Hold 2 seconds and lower slowly. Perform _____ sets of _____ repetitions _____ times daily.



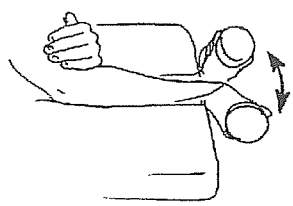
9B. **Elbow Extension (Abduction):** Raise involved arm overhead. Provide support at elbow from uninvolved hand. Straighten arm overhead. Hold 2 seconds and lower slowly. Perform _____ sets of _____ repetitions _____ times daily.



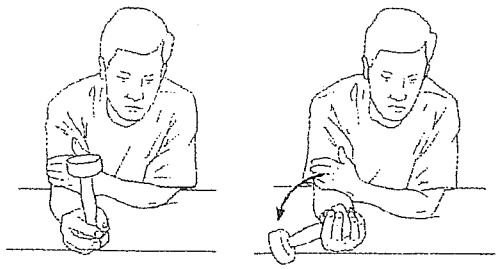
10A. **Wrist Extension:** Supporting the forearm and with palm facing downward, raise weight in hand as far as possible. Hold 2 seconds and lower slowly. Perform _____ sets of _____ repetitions _____ times daily.



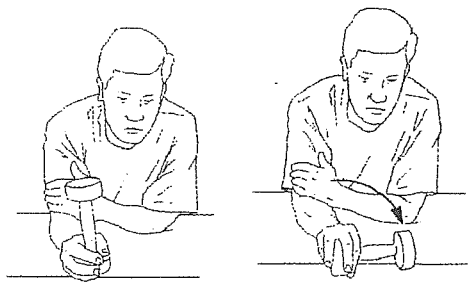
10B. **Wrist Flexion:** Supproting the forearm and with palm facing upward, lower a weight in hand as far as possible and then curl it up as high as possible. Hold for 2 seconds and lower slowly.



10C. **Supination:** Forearm supported on table with wrist in neutral position. Using a weight or hammer, roll wrist taking palm up. Hold for a 2 count and return to starting position. Perform _____ sets of _____ repetitions _____ times daily.



10D. **Pronation:** Forearm should be supported on a table with wrist in neutral position. Using a weight or hammer, roll wrist taking palm down. Hold for a 2 count and return to starting position. Perform _____ sets of _____ repetitions _____ times daily.



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SPORTS MEDICINE

Interval Throwing Program for Baseball Players – Phase I

The Interval Throwing Program (ITP) is designed to gradually return motion, strength and confidence in the throwing arm after injury or surgery by slowly progressing through graduated throwing distances. The ITP is initiated upon clearance by the athlete's physician to resume throwing, and performed under the supervision of the rehabilitation team, (physician, physical therapist and athletic trainer).

The program is set up to minimize the chance of re-injury and emphasize pre-throwing warm-up and stretching. In development of the interval throwing program, the following factors are considered most important.

1. The act of throwing the baseball involves the transfer of energy from the feet through the legs, pelvis, trunk, and out the shoulder through the elbow and hand. Therefore, any return to throwing after injury must include attention to the entire body.
2. The chance for re-injury is lessened by a graduate progression of interval throwing.
3. Proper warm-up is essential.
4. Most injuries occur as the result of fatigue.
5. Proper throwing mechanics lessen the incidence of re-injury.
6. Baseline requirements for throwing include:
   - Pain-free range of motion
   - Adequate muscle power
   - Adequate muscle resistance to fatigue

Because there is an individual variability in all throwing athletes, there is no set timetable for completion of the program. Most athletes, by nature, are highly competitive individuals and wish to return to competition at the earliest possible moment. While this is a necessary quality of all athletes, the proper channeling of the athlete's energies into a rigidly controlled throwing program is essential to lessen the chance of re-injury during the rehabilitation period. The athlete may have the tendency to want to increase the intensity of the throwing program. This will increase the incidence of re-injury and may greatly retard the rehabilitation process. It is recommended to follow the program rigidly as this will be the safest route to return to competition.

During the recovery process the athlete will probably experience soreness and a dull, diffuse aching sensation in the muscles and tendons. If the athlete experiences sharp pain, particularly in the joint, stop all throwing activity until this pain ceases. If continued pain, contact your physician.

Weight Training: The athlete should supplement the ITP with a high repetition, low weight exercise program. Strengthening should address a good balance between anterior and posterior musculature so that the shoulder will not be predisposed to injury. Special emphasis must be given to posterior rotator cuff musculature for any strengthening program. Weight training will not increase throwing velocity, but will increase the resistance of the arm to fatigue and injury. Weight training should be done the same day as you throw; however, it should be after your throwing is completed, using the day in between for flexibility exercises and a recovery period. A weight training pattern or routine should be stressed at this point as a "maintenance program." This pattern can and should accompany the athlete into and throughout the season as a deterrent to further injury. It must be stressed that weight training is of no benefit unless accompanied by a sound flexibility program.

Individual Variability: The ITP is designed so that each level is achieved without pain or complications before the next level is started. This sets up a progression that a goal is achieved prior to advancement instead of advancing to a specific timeframe. Because of this design, the ITP may be used for different levels of skills and abilities from those in high school to professional levels. The reasons for being in the ITP will vary from person to person. Example: One athlete may wish to use alternate days throwing with or without using weights in between; another athlete may have to throw every third or fourth day due to pain or swelling. "Listen to your body – it will tell you when to slow down." Again, completion of the steps of the ITP will vary from person to person. There is no set timetable in terms of days to completion.

Warm-up: Jogging increases blood flow to the muscles and joints thus increasing their flexibility and decreasing the chance of re-injury. Since the amount of warm-up will vary from person to person, the athlete should jog until developing a light sweat, then progress to the stretching phase.

Stretching: Since throwing involves all muscles in the body, all muscle groups should be stretched prior to throwing. This should be done in a systematic fashion beginning with the legs and including the trunk, back, neck and arms. Continue with capsular stretches and L-bar range of motion exercises.

Throwing Mechanics: A critical aspect of the ITP is maintenance of proper throwing mechanics throughout the advancement. The use of the Crow-Hop method simulates the throwing act, allowing emphasis of the proper body mechanics. This throwing method should be adopted from the set of the ITP. Throwing flat footed encourages improper body mechanics, placing increases tress on the throwing arm and, therefore, predisposing the arm to re-injury. The pitching coach and sports biomechanicianist (if available) may be valuable allies to the rehabilitation team with their knowledge of throwing mechanics.

Components of the Crow-Hop method are first a hop, then a skip, followed by the throw. The velocity of the throw is determined by the distance, whereas the ball should have only enough momentum to travel each designed distance. Again, emphasis should be

placed upon proper throwing mechanics when the athlete beings phase two: "Throwing Off the Mound" or from the athlete's respective position, to decrease the chance of re-injury.

Throwing: Using the Crow-Hop method, the athlete should begin warm-up throws at a comfortable distance (approximately 30-45 ft.) and then progress to the distance indicated for that phase (refer to Table 1). The program consists of throwing at each step 2 to 3 times without pain or symptoms before progressing to the next step. The object of each phase is for the athlete to be able to throw the ball without pain the specified number of feet (45 ft., 60 ft., 90 ft., 120 ft., 150 ft., 180 ft.), 75 times at each distance. After the athlete can throw at the prescribed distance without pain they will be ready for throwing from flat ground 60ft, 6 in. in the normal pitching mechanics or return to their respective position (step 14). At this point, full strength and confidence should be restored in the athlete's arm. It is important to stress the Crow-Hop method and proper mechanics with each throw. Just as the advancement to this point has been gradual and progressive, the return to unrestricted throwing must follow the same principles. A pitcher should first throw only fast balls at 50%, progressing to 75% and 100%. At this time, he may start more stressful pitches such as breaking balls. The position player should simulate a game situation, again progressing at 50-75 –100%. Once again, if an athlete has increased pain, particularly at the joint, the throwing program should be backed off and re-advanced as tolerated, under the direction of the rehabilitation team.

Batting: Depending on the type of injury that the athlete has, the time of return to batting should be determined by the physician. It should be noted that stress placed upon the arm and should in the batting motion are very different from the throwing motion. Return to unrestricted use of the bat should also follow the same progression guidelines as seen in the training program. Begin with dry swings progressing to hitting off the tee, then soft toss and finally live pitching.

Summary: In using the Interval Throwing Program (ITP) in conjunction with a structured rehabilitation program, the athlete should be able to return to full competition status, minimizing any chance of re-injury. The program and its progression should be modified to meet the specific needs of each individual athlete. A comprehensive program consisting of a maintenance strength and flexibility program, appropriate warm-up and cool down procedures, proper pitching mechanics, and progressive throwing and batting will assist the baseball player in returning safely to competition.

45' Phase

Step 1: A) Warm-up Throwing
B) 45' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 45' (25 Throws)
Step 2: A) Warm-up Throwing
B) 45' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 45' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 45' (25 Throws)

60' Phase

Step 3: A) Warm-up Throwing
B) 60'(25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 60' (25Throws)
Step 4: A) Warm-up Throwing
B) 60' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 60' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 60' (25 Throws)

90' Phase

Step 5: A) Warm-up Throwing
B) 90' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 90' (25 Throws)
Step 6: A) Warm-up Throwing
B) 90' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 90' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 90' (25 Throws)

120' Phase

Step 7: A) Warm-up Throwing
B) 120' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 120' (25 Throws)
Step 8: A) Warm-up Throwing
B) 120' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 120' (25 Throws)
F) Rest 5-10 min.
G) Warm-up throwing
H) 120' (25 Throws)

150' Phase

Step 9: A) Warm-up Throwing
B) 150' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 150' (25 Throws)
Step 10: A) Warm-up Throwing
B) 150' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 150' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 150' (25 Throws)

180' Phase

Step 11: A) Warm-up Throwing
B) 180' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 180' (25 Throws)
Step 12: A) Warm-up Throwing
B) 180' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 180' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 180' (25 Throws)

Step 13: A) Warm-up Throwing
B) 180' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 180' (25 Throws)
Step 14: Begin Throwing off the mound or return to respective position.

Throwing Program should be performed every other day, unless otherwise specified by your physician or rehabilitation specialist.

Perform each step __ times before progressing to next step.

Flat Ground Throwing

A) Warm-up Throwing
B) Throw 60 ft. (10-15 throws)
C) Throw 90 ft. (10 throws)
D) Throw 120 ft. (10 throws)
E) Throw 60 ft. (flat ground) using pitching mechanics (20-30 throws)

Flat Throwing

A) Warm-up Throwing
B) Throw 60 ft. (10-15 throws)
C) Throw 90 ft. (10 throws)
D) Throw 120 ft. (10 throws)
E) Throw 60 ft. (flat ground) using pitching mechanics (20-30 throws)
F) Throw 60-90 ft. (10-15 throws)
G) Throw 60 ft. (flat ground) using pitching mechanics (20 throws)

Interval Throwing Program – Throwing Off the Mound – Phase II

After the completion of Phase I of the Interval Throwing Program (ITP) and the athlete can throw to the prescribed distance without pain the athlete will be ready for throwing off the mound or return to their respective position. At this point, full strength and confidence should be restored in the athlete's arm. Just as the advancement to this point has been gradual and progressive, the return to unrestricted throwing must follow the same principles. A pitcher should first throw only fast ball at 50%, progressing to 75% and 100%. At this time, the athlete may start more stressful pitches such as breaking balls. The position player should simulate a game situation, again progressing at 50-75-100%. Once again, if an athlete has increased pain, particularly at the joint, the throwing program should be backed off and re-advanced as tolerated, under the direction of the rehabilitation team.

Summary: In using the Interval Throwing Program (ITP) in conjunction with a structured rehabilitation program, the athlete should be able to return to full competition status, minimizing any chance of re-injury. The program and its progression should be modified to meet the specific needs of each individual athlete. A comprehensive program consisting of a maintenance strength and flexibility program, appropriate warm-up and cool-down procedures, proper pitching mechanics, and progressive throwing and batting will assist the baseball player in returning safely to competition.

STAGE ONE: FASTBALLS ONLY

Step 1: Interval Throwing
15 Throws off mound 50%

(Use Interval Throwing to 120' Phase as warm-up)

Step 2: Interval Throwing
30 Throws off mound 50%

Step 3: Interval Throwing
45 Throws off mound 50%

ALL THROWING OFF THE MOUND SHOULD BE DONE IN THE PRESENCE OF YOUR PITCHING COACH TO STRESS PROPER THROWING MECHANICS

Step 4: Interval Throwing
60 Throws off mound 50%

Step 5: Interval Throwing
70 Throws off mound 50%

(Use speed gun to aid in effort control)

Step 6: 45 Throws off mound 50%
30 Throws off mound 75%

Step 7: 30 Throws off mound 50%
45 Throws off mound 75%

Step 8: 65 Throws off mound 75%
10 Throws off mound 50%

STAGE TWO: FASTBALLS ONLY

Step 9: 60 Throws off mound 75%
15 Throws in Batting Practice

Step 10: 50-60 Throws off mound 75%
30 Throws in Batting Practice

Step 11: 45-50 Throws off mound 75%
45 Throws in Batting Practice

STAGE THREE

Step 12: 30 Throws off mound 75% warm-up
15 Throws off mound 50% BREAKING BALLS
45-60 Throws in Batting Practice (fastball only)

Step 13: 30 Throws off mound 75%
30 Breaking Balls 75%
30 Throws in Batting Practice

Step 14: 30 throws off mound 75%
60-90 Throws in Batting Practice (Gradually increase breaking balls)

Step 15: SIMULATED GAME: PROGRESSING BY 15 THROWS PER WORKOUT (Pitch Count)

TREATING THE GOLFER'S SHOULDER INJURY

Kevin E. Wilk, DPT
Champion Sports Medicine
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I. Introduction

A. Golfer's in the United States

1. 26 million golfers in USA

2. The number of individuals playing are increasing

   a. Over 2 million new golfers each year

3. Golfer's performance

   a. National handicap: 15
   b. Will not change anymore than three in the golfer's lifetime

4. Average age of golfer 52 years ± 18 years

5. ***Most golfers' view golf as strictly a skill sport – Not True***
   Must be in golf physical condition !!!
   Specific Physical Attributes Allow Skilled Play !!!!

B. Golfer's Injuries

1. 65-80% of golfers will sustain injury

   a. Professional golfer: 85%
   b. Amateur golfer: 65%

2. Most common injury among professionals

   a. Left wrist: 27%
   b. Low back: 24%
   c. Left hand:
   d. Left shoulder: } combined 7%
   e. Left elbow:
   f. Right shoulder: 3%

3. Most common injury among amateurs

   a. Low back

b. Left elbow
c. Left shoulder
d. Left wrist

McCarroll: Clin Sports Medicine 1996

4. Shoulder injuries

a. Most common in older players
b. Especially lead shoulder
c. Pain at top of back swing
d. Appears to be impingement type pain

McCarroll and Mallon: Medicine Tee to Green 1994

5. Professional players

a. Began playing at age 7-8
b. Play or practice 10 months/year
c. Usually play 11.2 months
d. Hit up to 1,000 balls/day

1) 70% of injuries caused by repetitive practice swings
2) Only 7% during competition

6. Amateur players

a. Began playing later in life
b. Play or practice 7-9 months/year
c. Play less consistent (2 times a week)
d. Hit up to 125 balls/day (2-3 times a week)

7. Amateur golfers generate significantly greater peak shear and lateral bending forces and greater torque than professionals

- Pros use 50% less muscle activity, yet generate 34% more club head speed

II. The Golf Swing

A. Overview

1. Only necessary element required to hit a good shot

a. *Swing path*

2. Only thing that can impede the swing path

   a. *The golfer's body*

3. Maximum velocity during swing

	LPGA	PGA
Hip Turn	536	451
Shoulder Turn	692	713
Arm Velocity	1082	1151
Club Velocity	1688	2102

(Degrees Per Second)

B. Phases of the Golf Swing

1. Set-up position
2. Back swing phase
3. Down swing phase
   - forward swing
   - acceleration
4. Follow through phase

C. Set-up Position

1. Important phase of golf swing
2. Purpose:

   a. Align golfer with target
   b. Establish postural balance

3. Position:

   a. Knee flexed 20-25°
   b. Weight distribution: 50-60% on back foot
   c. Primary spinal angle (trunk flexion)
   d. Secondary spinal angle (lateral right bend)

4. Improper setup position

   a. Use spine to produce trunk flexion instead of hips
   b. Excessive grip pressure
   c. Postural balance poor

D. The Backswing Phase (Take away)

1. Purpose:

    a. Position and align the golfer's hub to execute a powerful swing

2. Linear movement

3. Trunk and shoulder rotation

4. Backswing movements

    a. Shoulder (lead) adducts and IR
    b. Shoulder (back) abduct and ER

5. Pelvic rotation of at least 45°

6. Backswing complete when club is parallel (or near parallel) to ground

    Critical movement but unnatural movement

7. Improper backswing phase

    a. Common flow - lateral movement
    b. Lateral shift instead rotatory movement
    c. Lack of trunk rotation

8. a. Back (back)
    b. Wrist (back)
    c. Elbow (back)
    d. Knee (back)
    e. Shoulder (back)
    21%

E. The Down Swing Phase (Forward Swing and Acceleration)

1. Initiated by hip turn and weight transfer

2. Centrifugal force and angular momentum

3. Clubhead speed: 2581^{0}/sec

4. Arm speed: 1165^{0}/sec

    Barrantine, Fleisig, Johnson: ASMI 1999

5. At impact (Occurs for 0.0005 sec)

   a. Highest incidence of injuries during this phase (impact)

6. Muscle activity: latissimus dorsi, pectoralis major, subscapulars

7. Improper down swing phase

   a. Loss of swing path due to lateral shifting
   b. Amateurs generate 50-80% greater spinal forces and greater EMG
   c. Yet 35% less clubhead speed than professionals

8. a. Elbow (lead)
   b. Wrist (lead)
   c. Back
   d. Knee (back)
   50%

F. The Follow Through Phase

1. Body gradually decelerates rotatory movements

2. Shoulder function reverse of back swing

   a. Lead shoulder: abducts and ER
   b. Back shoulder: adducts and IR

3. Eccentric muscle activity

4. Second highest incidence of injuries (30%)

5. a. Back
   b. Knee (lead)
   c. Shoulder (back)
   d. Ankle (back)
   e. Elbow (back)
   29%

G. Physical Factors That Can Limit the Golf Swing

1. Loss of motion and poor flexibility

   a. Shoulders
   b. Low back

c. Hips and pelvis

2. Poor strength

3. Improper technique

III. The Golfer's Evaluation

A. Range of Motion of Flexibility

1. Cervical spine

2. Lumbar spine (F/E; SB)

3. Shoulder (ER/IR; horizontal Abd/Add; Abd)

Horizontal Add 130° (lead shoulder)
External rotation 100° (back shoulder)
Causes if limited:
- Steep swing off plane
- Improper grip
- Elbow breakdown
- Club path altered
- Lateral slide

4. Wrist (F/E; deviations, thumb ext)

5. Lower extremity (hamstrings; hip ER/IR; F/E)

- Utilize hip hinge, not spinal flexion to achieve proper setup

6. Thoracic lumbar rotation

7. Rotatory component

a. Thoracic rotation
b. Lumbopelvic rotation
c. Lead shoulder add/IR
d. Backside hip IR

B. Muscular Strength

1. Shoulder girdle

a. ER/IR
b. Abd/Add
c. Horizontal Abd/Add

2. Scapular strength

a. Retraction
b. Protraction
c. Elevation
d. Depression

3. Wrist strength

a. Ext/Flex
b. Sup/pronation

C. The Functional Test

1. Golf swing analysis

2. Performed by professional instructors

3. Biomechanical analysis (video)

4. Analyze and break down

Shoulder

a. Limited ER – back shoulder

- Difficult keeping club on plane
- Flying elbow
- First more over top
- Outside in swing (slice)

b. Limited horizontal Add – lead

- Limits full backswing potential
- Can cause steep swing (impingement)
- Elbow breakdown
- Possible AC joint pathology (poor distance)

c. R.C. weakness

- Decreased club control/speed
- Increased stress post capsule

IV. Rehabilitation of the Golfer's Shoulder Injury

A. Key to Successful Treatment - Differential Diagnosis

1. Common lesions seen:

a. Rotator cuff inflammation (tendonitis)
b. Subacromial impingement
c. Rotator cuff strain
d. Rotator cuff tear
e. Glenohumeral hyperlaxity
f. Scapular dyskinesthias
g. Cervical spine contributing to shoulder pain

2. Other Factors

- Lack of ROM/flexibility
- Thoracic posture
- Rotator cuff strength
- Arthritic conditions
- Hypo/hyper mobility

B. Treatment Plan

1. Stretching and flexibility

a. Normalize shoulder motion
b. Bilateral shoulders

1) Horizontal adduction (back shoulder)
Horizontal abduction for lead shoulder
2) ER/IR scapular plane
3) ER/IR at 90° Abd
4) Back shoulder ER at 45 deg of abduction
4) Flex/Abduction

c. Begin with AAROM and PROM progress to capsular stretching

d. assess posture & scapular position - critical

2. Stretch kinetic chain structure

a. Neck

b. Trunk side bending
c. Trunk rotation
d. Thoracic rotation
e. Hamstring
f. Low back

3. Muscular strengthening

a. ER/IR tubing
b. Sidelying ER
c. Full can
d. Prone horizontal abduction
e. Prone rowing, pull downs
f. push-ups, bench press

To increase club speed = driving distance
Strengthen: pectoralis major, lats, deltoids

4. Strengthen entire kinetic chain (legs and trunk)

a. Squats
b. Hip abduction
c. Sit-ups
d. Trunk extension
e. Neck
f. bicycle

5. Golf swing analysis

a. Consultation with professional instructor
b. Analysis of swing
c. Identify problem
d. Develop drills
e. Practice, practice, practice
h. Continue flexibility, strengthening exercises

6. Return to play

a. Interval golf program
b. Gradually increase number of swings, club length, etc
c. Gradual return to play

V. Conditioning & Prevention of Golf Injuries

A. Several Key Components to Preventing Injury

1. Condition to Play Not Play to Condition
2. Correct postural adaptations
3. Restore flexibility
4. Improve lumbar & pelvic flexibility
5. Strengthen scapular muscles & rotator cuff
6. Improve swing mechanics
7. Analyze swing with a professional teacher
8. Improve skill level

VI. Summary

A. Key Points

1. Golf injuries are common

2. Low back and lead shoulder most common

3. Injuries due to:

   a. Poor physical condition
   b. Inflexibility
   c. Skill

4. Kinetic chain influence - transfer of energy
   legs – trunk – upper extremity

5. ***Trying to do something that physically can't do***

6. Rehabilitation based on assessment

7. ***Get in shape to play (condition to play)***
   Leads to better play & less injuries

KEW:1/09 attachments

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Interval Golf Rehabilitation Program

The same principles should be followed with the interval golf program as with the interval baseball program. Proper warm-up, stretching, and strengthening should still be implemented throughout the entire interval golf rehabilitation program. As you start your program, remember mechanics play an important role in your recovery. If any further questions, please contact your physician or rehabilitation specialist.

	MONDAY	WEDNESDAY	FRIDAY
1st Week	20 putts 15 chips 5' rest 15 chips	25 putts 15 chips 5' rest 25 chipping	20 putts 20 chips 5' rest 20 putts 20 chips 10 irons off tee 5' rest 10 chips 5 irons off tee
2nd Week	20 chips 10 short irons 5' rest 10 short irons 15 med. irons (5 iron off tee)	20 chips 15 short irons 10' rest 15 short irons 15 chips Putting 15 med. irons	15 short irons 10 medium irons 10' rest 20 short irons 15 chips
3rd Week	15 short irons 20 medium irons 10' rest 5 long irons 15 short irons 15 medium irons 10' rest 20 chips	15 short irons 10 medium irons 10 long irons 10' rest 10 short irons 10 medium irons 5 long irons 5 wood	15 short irons 15 medium irons 10 long irons 10' rest 10 short irons 10 medium irons 10 long irons 10 wood
4th Week	15 short irons 10 medium irons 10 long irons 10 drives 15' rest Repeat	Play 9 holes	Play 9 holes
5th Week	9 holes	9 holes	18 holes

*Flexibility exercises before hitting
*Use ice after hitting
(') – Abbreviation for minute

Key to Golf Programs:
chips – pitching wedge
short irons – W, 9, 8
medium irons – 7, 6, 5
long irons – 4, 3, 2
woods – 3, 5
drives – driver

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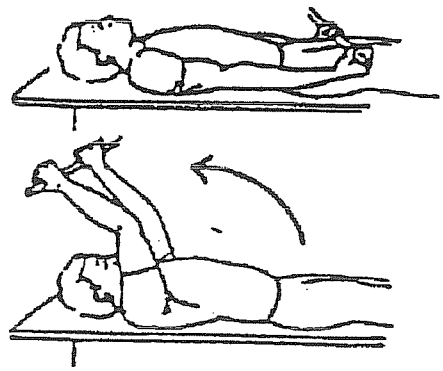
Interval Tennis Program

	MONDAY	WEDNESDAY	FRIDAY
1st Week	12 FH 8 BH 10 min. rest 13 FH 7 BH	15 FH 8 BH 10 min. rest 15 FH 7 BH	15 FH 10 BH 10 min. rest 15 FH 10 BH
2nd Week	25 FH 15 BH 10 min. rest 25 FH 15 BH	30 FH 20 BH 10 min. rest 30 FH 20 BH	30 FH 25 BH 10 min. rest 30 FH 25 BH
3rd Week	30 FH 25 BH 10 SR 10 min. rest 30 FH 25 BH 10 SR	30 FH 25 BH 15 SR 10 min. rest 30 FH 25 BH 15 SR	30 FH 30 BH 15 SR 10 min. rest 30 FH 15 SR 10 min. rest 30 FH 30 BH 15 SR
4th Week	30 FH 30 BH 10 SR 10 min. rest Play 3 games 10 FH 10 BH 5 SR	30 FH 30 BH 10 SR 10 min. rest Play set 10 FH 10 BH 5 SR	30 FH 30 BH 10 SR 10 min. rest Play 1 ½ sets 10 FH 10 BH 3 SR

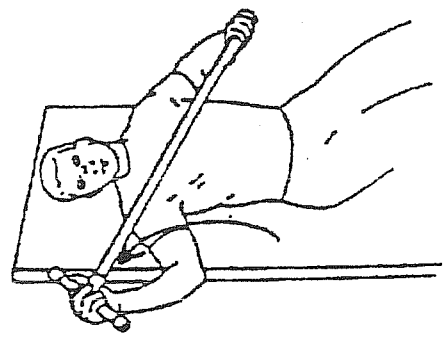
SR = Serves FH = Forehand shots BH = Backhand shots

Fundamental Shoulder Exercises

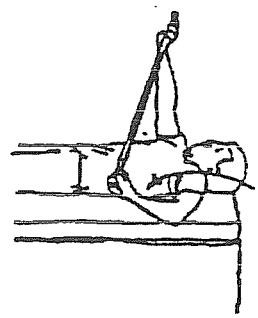
Range of Motion Exercises

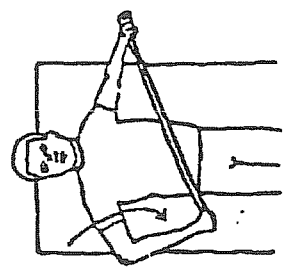


1. L-Bar Flexion: Lie on back and grip L-Bar between index finger and thumb, elbows straight. Raise both arms overhead as far as possible keeping thumbs up.
Hold for___ seconds and repeat_____times



2. L-Bar External Rotation, Scapular Plane: Lie on back with involved arm 45^0 from body and elbow bent at 90^0. Grip L-Bar in the hand of involved arm and keep elbow in flexed position. Using uninvolved arm, push involved arm into external rotation.
Hold for _____seconds, return to starting position. Repeat_____times

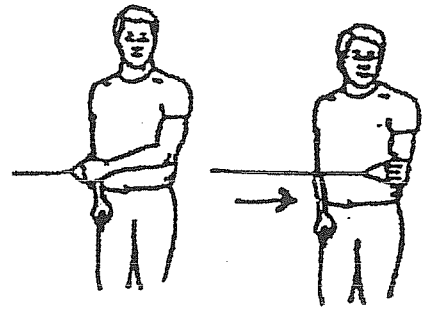




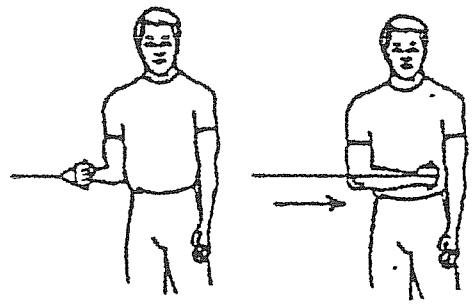
3. L-bar Internal Rotation, Scapular Plane: Lie on back with involved arm 45^0 from body and elbow bent at 90^0. Grip L-Bar in the hand of involved arm and keep elbow in flexed position. Using the uninvolved arm, push involved arm into internal rotation.
Hold for _____seconds, return to starting position. Repeat_____times

Strengthening Exercises

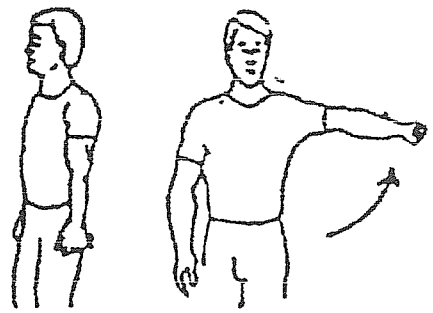
1. TUBING, EXTERNAL ROTATION: Standing with involved elbow fixed at side, elbow bent to 90^0 and involved arm across the front of the body. Grip tubing handle while the other end of tubing is fixed. Pull out with arm, keeping elbow at side. Return tubing slowly and controlled.
Perform _____ sets of _____ reps.



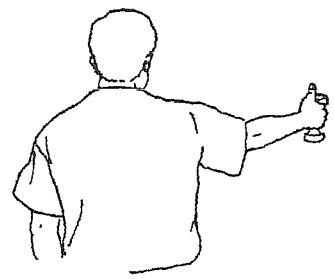
2. TUBING, INTERNAL ROTATION: Standing with elbow at side fixed at 90^0 and shoulder rotated out. Grip tubing handle while other end of tubing is fixed. Pull arm across body keeping elbow at side. Return tubing slowly and controlled.
Perform _____ sets of _____ reps.



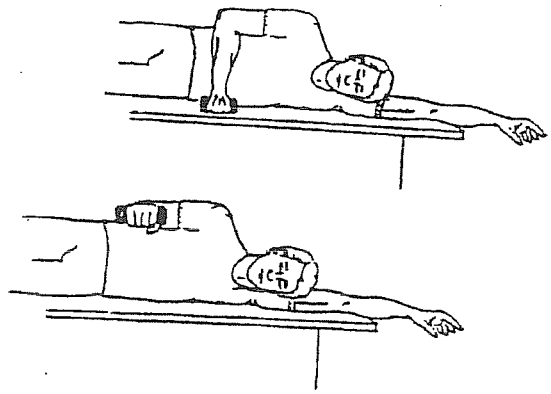
3. LATERAL RAISES TO 90^0: Standing with arm at side, elbow straight, and palm against side. Raise arm to side, rotating palm up as arm reaches 90^0. Do not go above shoulder height.
Hold for _____ seconds and lower slowly.
Perform _____ sets of _____ reps.



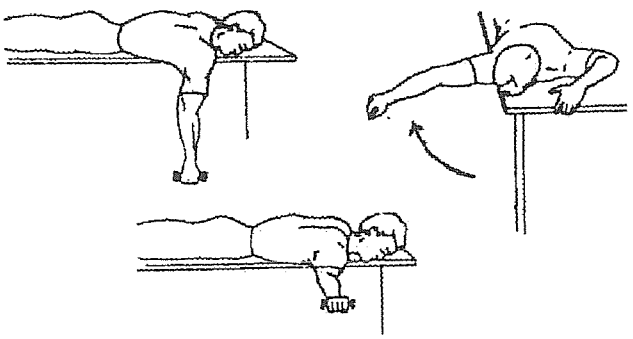
4. "FULL CAN": Stand with elbow extended and thumb up. Raise arm to shoulder level at 30^0 angle in front of body. Do not go above shoulder level.
Hold for _____ seconds and lower slowly.
Perform _____ sets of _____ reps.



5. **SIDE-LYING EXTERNAL ROTATION:** Lie on uninvolved side, with involved arm at side of body and elbow bent to 90^0. Keeping the elbow of involved arm fixed to side, raise arm.
Hold _____ seconds and lower slowly. Perform _____ sets of _____ reps.



6. PRONE HORIZONTAL ABDUCTION: Lie on table, face down, with involved arm hanging straight to floor and palm facing down. Raise arm out to the side, parallel to the floor.
Hold _____ seconds and lower slowly. Perform _____ sets of _____ reps.



7. PRONE ROWING: Lying on your stomach with your involved arm hanging over the side of the table, dumbbell in hand and elbow straight. Slowly raise arm, bending elbow, and bring dumbbell as high as possible.
Hold at the top for _____ seconds, then lower slowly. Perform _____ sets of _____ reps.