

# Shoulder Injuries & Postrehabilitation

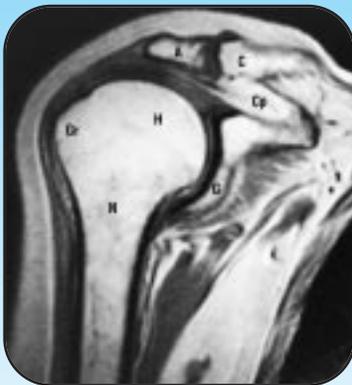
## INTRODUCTION:

The shoulder is the most flexible joint in the body, and is second only to the knee as a source of joint injury. It achieves this flexibility through muscles and ligaments, sacrificing the stability of a bony joint. The shoulder can be injured in a number of ways, sometimes after a sudden traumatic event like a fall or accident, or sometimes over long periods of time due to constant use. Regardless of the cause, the common denominator is the shoulder hurts and it is difficult to do things that did not previously cause discomfort. Depending on the severity of injury, the shoulder joint can sometimes require months of therapy.



It may be helpful to understand some of the aspects of shoulder anatomy. The clavicle, the bone at the top of the chest, is the only bony attachment of the shoulder to the axial skeleton. Ligaments and muscles provide almost all the strength and stability to the shoulder. The upper arm bone, called the humerus, has an enlarged top, termed the "head." The head fits into a saucer-like depression in the scapula, a bone whose outline is best seen looking at the back in a mirror. The scapula is commonly referred to as the shoulder bone. The depression in the scapula is called the glenoid. The humerus is held into the glenoid by a rim of cartilage and the rotator cuff, which is actually the combined tendons of four different muscles; the supraspinatus, the infraspinatus, the subscapularis, and the teres minor. There is a capsule around the humerus and the glenoid, and an overhead extension of bone termed the acromion that serves to keep the humerus from being driven up and out of the socket. The rotator cuff tendon, because of constant lifetime use, is subject to wear and tear that may compromise its strength and hence the stability of the shoulder joint. Regardless of the type of shoulder injury, strengthening the rotator cuff will be an integral part of therapy.





There are several injuries that commonly occur to the shoulder. Injuries to the rotator cuff are the most common. Therapy is based on strengthening muscles that can help reduce the forces placed on the rotator cuff tendon. Arthritis or other conditions can lead to a condition called adhesive capsulitis, commonly called frozen shoulder. This can result from laxities in a stretched out capsule as the tissue tends to adhere back to itself. Therapies are directed toward improving range of motion and increasing muscle strength. Other injuries may involve trauma, such as a fall or impact. Bursitis of the shoulder involves inflammation of the sub-acromial bursa, which is just above the head of the humerus and serves as the cushion between this structure and the acromion. In all cases the goal is to promote pain relief, then gradually strengthen weak muscles and stretch tight ligaments so that healing can be accomplished with a return of both strength and function.

This book was designed to improve the ability of individuals to engage in self-directed exercise and therapy programs. Although they can be used in conjunction with a medical physician, physical therapist, personal trainer, or exercise physiologist, they are also adequate for self-study and application. The exercises are illustrated and described in visually appealing detail. They also provide a wide range of stretches and exercises that can be tailored to almost any condition, frequent or rare.

Self-care and rehabilitation are synonymous. Rehabilitation has more medical connotations, but someone does not need a medical condition to begin taking better care of themselves. Many of the conditions seen by physicians can be alleviated or substantially decreased through diligence with a home stretching or exercise program. This is becoming more important as people engage in jobs that overuse only a few muscles, for example, computer operators who maintain static positions of their neck, shoulder and arms for possibly an entire work day. Likewise, weekend warriors—whether they are doing battle on the ball field or the front lawn—frequently suffer from pain generated by strained muscles or ligaments that have been dormant the remaining six days of the week.

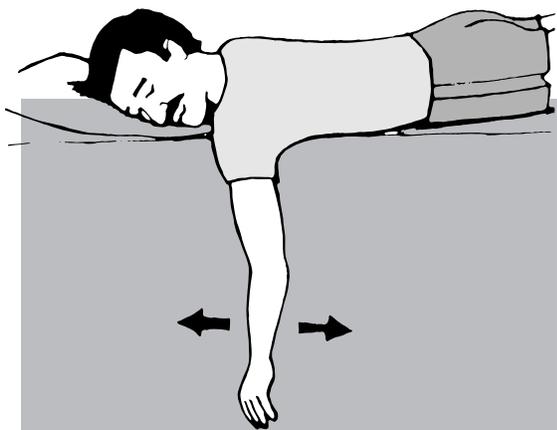
As with any exercise program, the input of a physician is necessary if an individual suffers from any type of chronic condition, e.g. heart disease, osteoporosis, diabetes, or chronic obstructive pulmonary disease. This is especially important if someone is just beginning a program after many years of sedentary activity. If there is any type of heart condition, you need to consult a physician before engaging in even the simplest of activities. Never underestimate the damage done by years of neglect or lack of activity.

The goal of this book, as with any approach to human health, is to promote a balance between the external environment and the internal body. Life is an interaction between mind, body and soul, that is shaped and influenced by job, family, and lifestyle. The latter has been sadly influenced to a large degree by television, time restraints, and commodities designed for a fast-paced existence. However, there is no short-cut to health. The good news is that very little time is required to maintain long term and cumulative gains. All that is needed is dedication, encouragement and the realization that everything that is done, no matter how minimal an effort, can add up to years of energy, relaxation, and improved health. I hope this book can contribute in some way to that path and outcome.

The programs described below are arranged in levels of intensity. The therapist can instruct you as to the intensity and frequency of each of the activities. Note any difficulties or unusual sensations you may experience for discussion with the therapist or physician. If you experience an exacerbation or flare-up of symptoms, decrease either the number of repetitions or the frequency of exercises per day until you can discuss the matter with the therapist or physician.

## LEVEL 1: INITIAL RANGING

This activity is usually started immediately after an injury when it is too painful to engage in more aggressive rehabilitation. The goal is simply to maintain as much range of motion as possible during the initial stages of healing, so that a frozen shoulder does not develop.

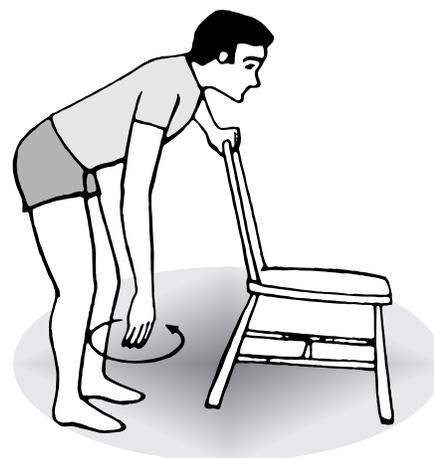


### Exercise 1

**Figure 1:** Lie on your stomach at the edge of your bed, allowing your injured arm to hang over the side. Relax your body as much as possible, including your neck muscles, letting your shoulder blade drop into the bed. Begin by slowly and gently swinging your arm forward and backward. Let the momentum of your arm carry out most of the motion and try not to use your shoulder or neck to generate movement; it may be necessary for someone else to begin swinging your arm. If your bed is too close to the floor to allow you to freely swing your arm, use the exercise described in figure 2.

### Exercise 2

**Figure 2:** Bring a strong, secure chair into an open area. Hold the chair with your uninjured arm and lean forward, bending at the waist and at your knees. Relax your neck and shoulder blade and let your arm drop down. Stay as relaxed as possible and use your entire body to swing your arm in a small circle, first clockwise and then counter-clockwise. Increase the circle gradually but be careful to not increase too significantly the speed of your rotation.



## LEVEL II: STRETCHING

Stretches should be done before any type of strengthening activity. The therapist can tell you which of the following stretches are most helpful for your condition. A useful guide is termed the “rule of fives.” Take five seconds to bring yourself into the stretch, hold the point of maximum stretch for five seconds, and then take five seconds to bring yourself out of the stretch. The body should be slowly pulled into a stretch; avoid sudden jerky movements and be aware of shifting and possibly losing balance.

The first three stretches involve sitting in a chair at the edge of a table. Make sure the chair will not slide on the floor. Adjust the distance of the chair to easily accomplish the appropriate stretch and note this distance in the log for the next time.

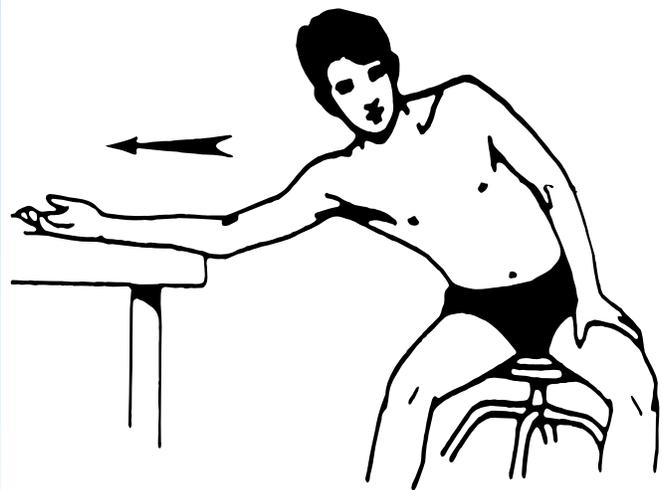


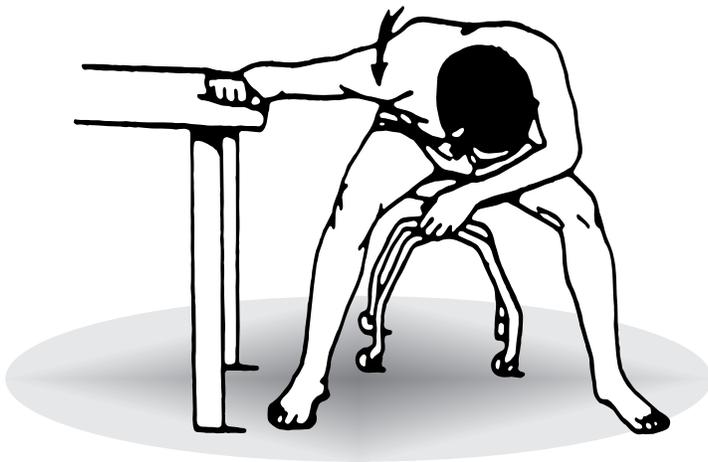
### Exercise 3

**Figure 3:** Sit facing the table. Bend forward at the waist, keeping your hand and forearm flat on the table with your palm facing down. Slide forward and note the stretch you feel in your shoulder. This stretches the forward flexors.

### Exercise 4

**Figure 4:** Sit with your side to the table. Rest your hand and forearm on the table with your palm facing up. Side bend into the table at your waist, bringing your head down toward your arm. This stretches the shoulder abductors.



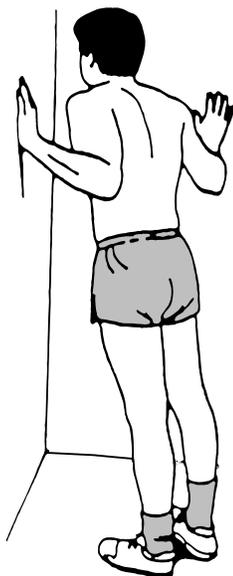
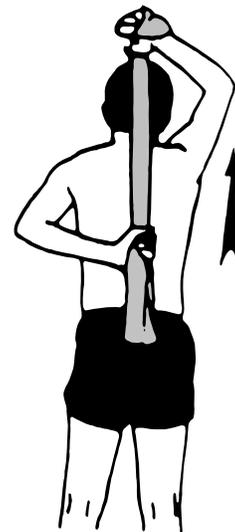


## Exercise 5

**Figure 5:** Sit with your side to the table. Rest your forearm and hand on the table with your palm facing down. Bend your upper body forward at the waist, keeping your forearm on the table. This stretches the external rotators.

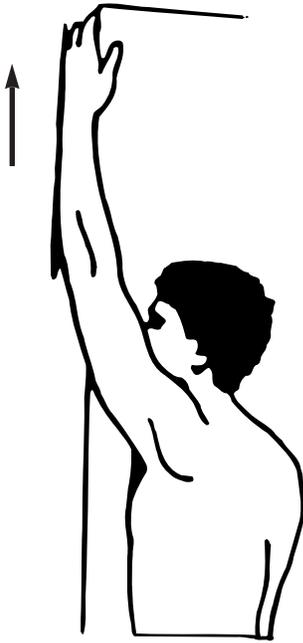
## Exercise 6

**Figure 6:** Bring the arm of your injured shoulder behind your back and grab onto a towel that is held above your head by your other arm. Slowly pull the arm of your injured shoulder straight up. It is important to pull directly overhead. If you are unsure of your balance, this stretch can be performed lying on the floor on your stomach. This stretches the internal rotators.



## Exercise 7

**Figure 7:** Stand a short distance away from a corner in the position shown, with your hands at shoulder level. Be careful to not stand too far away or you may lose your balance or be too far away to effectively push yourself out; it is better to start close and then move out as needed. Note the ideal distance in the exercise log. Lean forward into the corner and you will feel a stretch between the top of your shoulder blades. This is a general stretch.



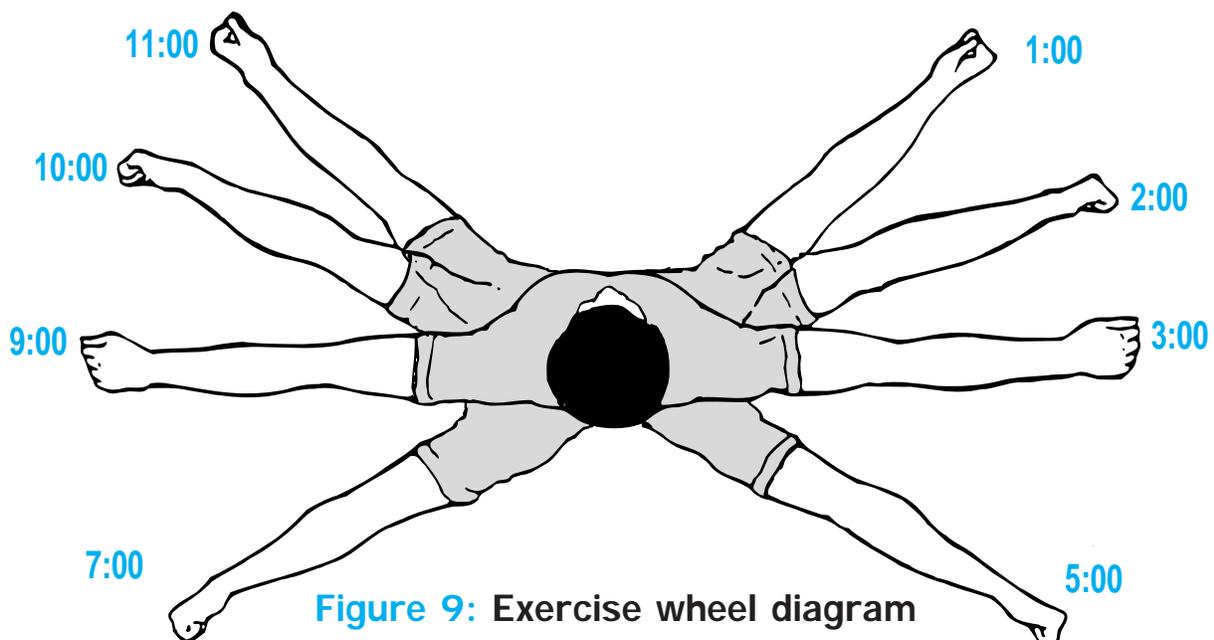
## Exercise 8

**Figure 8:** *This is a simple stretch.* Stand close to a wall and slowly walk up the wall with your hand, with the palm facing inward. This is a general stretch.

### LEVEL III: STRENGTHENING EXERCISES

Perform these exercises after performing the above stretches. Before beginning a specific strengthening exercise, perform the corresponding stretch. These exercises are performed with an elastic rubber tube. All of the exercises may not be required; do only those noted by the therapist. The direction is important as this determines the particular muscle group exercised. The diagram in figure (9) is a view looking down with arm positions shown relative to the locations of numbers on a clock; the individual is facing 12:00. Refer to this diagram to understand the directions. The arm needs to move in to perform each of the exercises.

<b>ANTERIOR DELTOID EXERCISE:</b>	<b>Thumb UP</b>	<b>11:00 - 1:00</b>
<b>SUPRASPINATUS EXERCISE:</b>	<b>Thumb DOWN</b>	<b>10:00 - 2:00</b>
<b>MIDDLE DELTOID EXERCISE:</b>	<b>Palm DOWN</b>	<b>9:00 - 3:00</b>
<b>POSTERIOR DELTOID EXERCISE:</b>	<b>Thumb DOWN</b>	<b>7:00 - 5:00</b>



**Figure 9:** Exercise wheel diagram

## Exercise 10

**Figure 10:** *Suprapinatus exercise.* Hold the tubing under your foot and pull straight up and out. Hold the tubing as shown, with your thumb down. Stretch to the 10:00 position if exercising your left side, to the 2:00 position if exercising your right side.

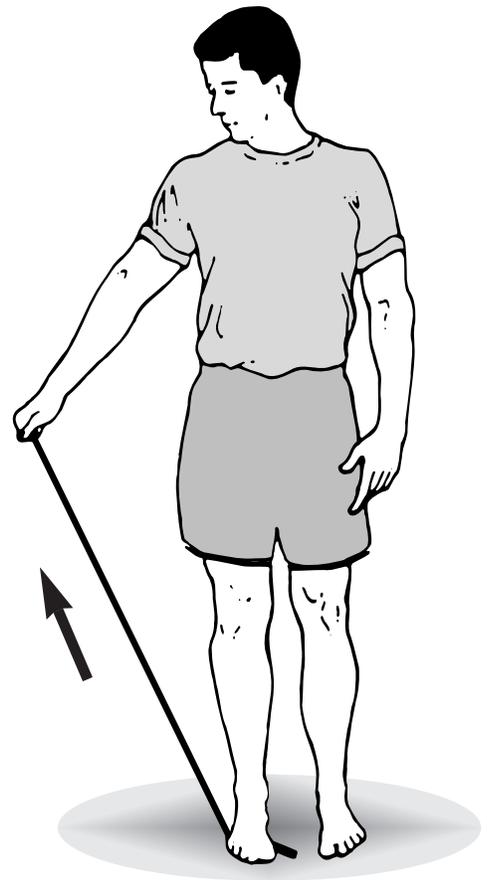


## Exercise 11

**Figure 11:** *Anterior deltoid exercise.* Hold the tubing under your foot and pull straight up and out. Hold the tubing as shown, with your thumb pointing up. Stretch to the 11:00 position if exercising your left side, to the 1:00 position if exercising your right side.

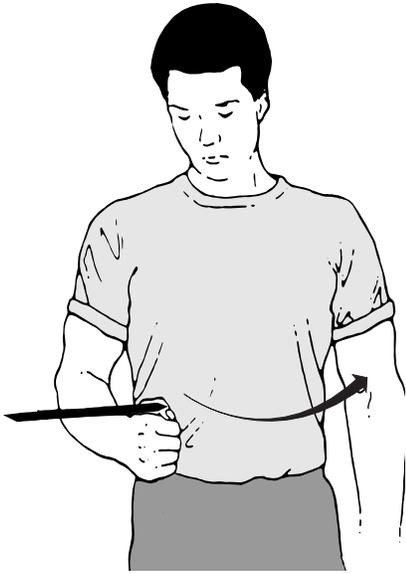
## Exercise 12

**Figure 12: Middle deltoid exercise.** Hold the tubing under your foot and pull straight up and out. Grasp the tubing as shown with your thumb forward and your palm down. Stretch to the 9:00 position if exercising your left side, to the 3:00 position if exercising your right side.



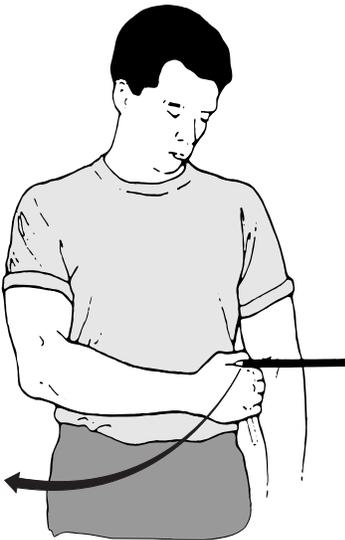
## Exercise 13

**Figure 13: Posterior deltoid exercise.** Hold the tubing under your foot and pull straight up and out. Grasp the tubing as shown with your thumb down and your palm facing behind you. Pull up and out away from your body but keep your hand behind you as if you are trying to reach behind your back. Stretch to the 7:00 position if exercising your left side, to the 5:00 position if exercising your right side.



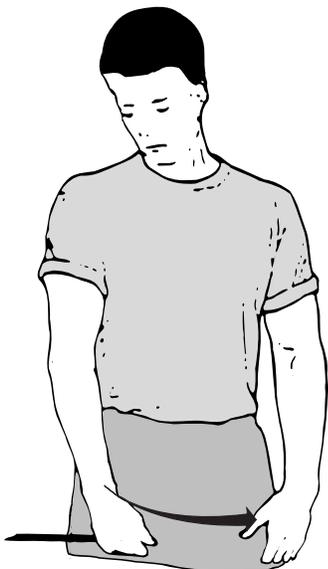
## Exercise 14

**Figure 14: Internal rotation exercise.** Tie the plastic tubing to a doorknob on a closed door. Step back from the door to bring the rubber tubing under tension. Keep your elbow at your side and bring your hand across the front of your body, touching your chest on the opposite side.



## Exercise 15

**Figure 15: External rotation exercise.** Tie the plastic tubing to a doorknob on a closed door. Keep your elbow at your side and bring your hand across your body until your hand is touching your chest on the opposite side. Step back from the door to bring the rubber tubing under tension. Extend your forearm and hand out in an arc across the front of your body, bringing the tubing under additional tension.



## Exercise 16

**Figure 16: Adduction exercise.** Tie the plastic tubing to a doorknob on a closed door. Keeping your arm straight along the side of your body move your arm across the front of your body, bringing the tubing under additional tension.

## LEVEL IV: HOME MODALITIES

You may use heat or ice at home. You can purchase professional cold packs that you keep in a refrigerator. A package of frozen peas works just as effectively. In either case, place a damp towel between the cold pack and your skin. After you stretch or exercise, or for general pain relief, keep the cold pack on the affected shoulder for 20 minutes, then off for 20 minutes; you can repeat this for two to three sessions for a total of 60 minutes of cold treatment.

You can also fill small paper cups with water and freeze them. These are nicknamed “ice-popsicles” and are used by holding them in one hand and rubbing over the painful area in the direction of the muscle fibers, peeling away the paper as the ice melts. If you have the desire and your therapist so approves, it may be beneficial to consider three phases to your home exercise program: (1) apply heat to your shoulder before your stretches and exercises; (2) proceed with your home exercise program, and; (3) finish with either heat or cold treatment. Again, check with your therapist.

Some people cannot tolerate ice and prefer heat using a heating pad. Again, 20 minutes on and 20 minutes off is an appropriate schedule. Another option is to alternate ice and heat. Ice will be more effective in reducing swelling and providing pain relief but if it is not comfortable, heat can also provide some benefits. However, in some cases heat may be harmful, so you need to check with your therapist. Record your modality instructions below.

### NOTES:

---

---

---

---

## ACUPRESSURE FOR TRIGGER POINTS

A trigger point is a tender circular or rope-like area of muscle that you can feel within the surrounding muscle. Pressing on this area causes pain, and you may also be able to actually roll a piece of tight muscle under your fingers. These are common in shoulder injuries and may develop anytime during your rehabilitation. You or someone else, can apply direct pressure for at least 45-60 seconds over the tender point and then gently massage the muscle in the direction of the muscle fibers. A helpful aid is the “ice popsicle,” described above. The cup can be held while the ice surface is pressed into the tender area. These points can recur but consistent self-treatment can alleviate the majority of the discomfort. A tennis ball pressed between the wall and the area of discomfort can also be helpful.

## BREATHING

Breathing is a natural pattern that can be utilized to provide additional comfort during the exercise program. Learning to breathe deeply and slowly helps you relax during exercises and stretches. Following is a script to help you breathe appropriately.

“Begin by first noticing your breathing pattern before you start your program. Take in a deep breath, relax, and exhale all the air you possibly can. Do not force yourself to over-breathe on your inhaled breaths, but do try to empty your lungs as much as possible when you exhale. Do this in a rhythmic pattern before, during, and after either stretching or strengthening. This pattern of breathing will soon become more natural and you will find that it not only helps you deal with any discomfort that is part of your exercise program, but can also be used as a relaxation aid during the day, before sleep, or in periods of high stress.”

## SCRIPTS

The shoulder is likely to be re-injured unless the inciting causes are corrected, especially those due to repetitive overuse in a strained working environment. The most important factor to consider after rehabilitation is how to minimize or eliminate the activity that originally caused the problem. Paying attention to the mechanics of the shoulder, trunk, and neck can minimize the workload placed on the shoulder.

- “Remember that any type of poor posture—sitting, sleeping, or lying—can also accentuate shoulder pain. A cervical pillow, lumbar cushion, or some other type of back support may be recommended by your therapist as the shoulder, neck, and back are intimately connected.”
- “The goal is to incorporate these activities into your daily routine not only at the beginning and end of the day but also during the work day as well. Running through a program of shoulder stretching before and after heavy work, prolonged sitting, or long drives can have ample rewards. Although these are simple preventive techniques, some people may not like the idea of interrupting their activities during the day. These exercises, as well as any other techniques demonstrated by your therapist, are only effective if incorporated into your lifestyle.”
- “Shoulder pain is preventable, but it requires some effort and vigilance. Good posture in conjunction with a daily stretching and strengthening program, and recognition of your limitations are simple but effective ways to minimize discomfort and injury, curbed only by your initiative. Since it is generally accepted that shoulder injuries are the result of a lifetime of improper consideration to biomechanics, it is never too soon to begin correcting bad habits.”

**Mark H. Scheutzow, MD, PhD**, is a cum laude graduate of The Ohio State College of Medicine. His training is in Physical Medicine and Rehabilitation, Pain Medicine, Addiction Medicine, and Medical Acupuncture. He practices pain medicine in Charlotte, North Carolina.

### DISCLAIMER NOTICE:

These manuals are presented only as a summary of information for health care providers involved in the rehabilitation of musculoskeletal conditions. No standard of care is stated or implied. These manuals are not intended nor properly used as a substitute for treatment, only as an adjunct to aid clinical expertise. The exact protocol and progress employed is the determination of the health care provider who assumes all responsibilities for its application.

## EXERCISE LOG:

Record your progress in the log below, noting the number of repetitions or sets of each exercise completed. Record any additional notes you may wish to discuss with the therapist or physician.

EXERCISE	DATE	NOTES						

### REFERENCES:

Agur, Anne M. 1991. *Grant's Atlas of Anatomy*, 9th. ed. Williams and Wilkins, Baltimore, MD. 650 pp.

Braddom, Randall L. 1996. *Physical Medicine and Rehabilitation*. W.B. Saunders Company. Philadelphia, PA. 1301 pp.

Brotzman, S. Brent. 1996. *Handbook of Orthopaedic Rehabilitation*. Mosby. St. Louis, MI. 384 pp.

Buschbaker, Ralph M. 1994. *Musculoskeletal Disorders. A Practical Guide For Diagnosis and Rehabilitation*. Andover Medical Publishers. Boston, MA. 326 pp.

Buschbaker, Ralph M., and Braddom, Randall L. 1994. *Sports and Rehabilitation: A Sport-Specific Approach*. Hanley and Belfus, Inc. Philadelphia, PA. 319 pp.

Fu, Freddie H., and Stone, David A. 1994. *Sports Injuries: Mechanisms, Prevention, and Treatment*. Williams and Wilkins. Baltimore, MD. 1040 pp.

Magee, David J. *Orthopaedic Physical Assessment*, 3rd. ed. W.B. Saunders, Philadelphia, PA. 805 pp.

Snider, Robert K. ed. 1997. *Essentials of Musculoskeletal Care*. American Academy of Orthopedic Surgeons. Rosemount, Ill. 686 pp.