

Modified Weight Lifting

initiating a weight-training program, explain the **Specific Adaptation to Imposed Demands (or SAID) principle. It states that the type of demand placed upon the body controls the type of adaptation that occurs.**¹ That is, if you want to jump higher, practice jumping. Patients need to train the body for what they want it to do. This again emphasizes the importance of having specific and pre-determined training goals in place.

Frequency, Duration, and Intensity

When discussing the frequency of weight training, teach patients that optimal results from early strength training are obtained from incorporating a minimum of one day of rest between sessions in which the same muscle group is worked. This concept is different for patients who typically during rehabilitation exercised at least one to two times each day. Teach them that, as the intensity of the exercises increases, the rest time becomes just as important as the training itself. Training the same muscle group at higher intensity two to three days each week has been shown to yield the best results. In addition, early **strength training increases damage to the muscle-tendon unit because of the eccentric load, so patients will need more rest to perform optimally.**

The goal of the preparatory phase of training is to develop a strength and endurance foundation. Patients use lighter weights and a larger number of repetitions, working to achieve three to four sets of 12 to 15 repetitions. The ideal speed is to maintain a six-second cycle for each repetition and an overall timeframe of 50 to 70 seconds for each exercise set because the muscles train anaerobically at this speed. Patients should continue this phase for as long as possible to develop a strong foundation for advanced strengthening.

Exercise Selection

I describe a three-tiered system of exercise selection. The first tier includes green-light exercises, which are safe to perform early in a weight-training program with minimal precautions. The second tier of exercises includes yellow-light exercises, which may be performed cautiously in later, more-advanced

stages of the program after a baseline level of strength has been achieved without experiencing any problems with the program. These exercises are mechanically safe, but must be performed with strict limitations. In addition, they may not be safe to perform until three to six months after the weight-training program begins. These yellow-light exercises may put the patient at risk for injury, and this risk often outweighs the benefits of a specific exercise. The third tier includes red-light exercises, which should be avoided indefinitely for any patient who has had a shoulder injury or surgery.

Exercise Movements to Avoid

Although the reasons vary slightly depending on the exercise, several exercises or movements are too demanding for the shoulder and should be avoided indefinitely. **Any exercise movement performed in an impingement position places undue stress, restricts blood flow within the rotator cuff, and mechanically pinches the rotator cuff.** These positions generally include any movement in the frontal plane (abduction) of the body or any movement in the sagittal plane accompanied by internal rotation.

Any weighted or resisted movement into excessive humeral extension beyond the plane of the body should be avoided. This includes both concentric and eccentric movements. **This position places abnormally high loads through the static anterior restraints, including the capsular complex, labrum, and biceps attachment. This position also places the rotator cuff muscles on a severe stretch.** This stretch creates a poor length-tension relationship for the cuff and, therefore, makes stabilizing the humeral head very difficult. Because of this mechanical disadvantage, the rotator cuff has to work excessively hard, which may leave it prone to a strain or tearing injury. With the cuff unable to adequately stabilize the humeral head, the anterior translation of the humeral head shifts an abnormally high load through the anterior static restraints, thus making them susceptible to injury as well. These specific exercises are labeled as red-light exercises in the Table and should be avoided indefinitely.

Table. The Three-Tiered System of Exercises for an Upper Extremity Weight-Training Program After Shoulder Injury^a

Exercises			
Body Area	Green Light	Yellow Light	Red Light
Back	Rows with a narrow or a neutral grip on a weight machine (A), with a pulley (A), or bent over with dumbbells (B)	Pull ups with the bar grip anterior to the head	Lateral pull downs or lateral pull ups performed behind the neck (A)
	Lateral pull downs from anterior to the head with a machine or pulley (C)		
Arms	Standing curls with barbells, dumbbells, or pulley (A)	Preacher curls with weight machine, barbells, or dumbbells	Dips with body weight or on a weight machine (A)
	Triceps extensions (B)	Overhead triceps press	
	Triceps kickbacks with a pulley or a free weight (C)		
Shoulder	Overhead press in front of the head with a neutral grip and humeral angle remaining in scaption progressing from dumbbells to weight machines to barbells (A)	Deltoid raises to the front or side with very light weight and the arm below the shoulder level	Upright rows (A)
	Shrugs with a dumbbell or barbell (B)	Reverse flies with the elbow in front of the body	Overhead press behind the neck (B)
	Deltoid raises in a position of scaption with the weight below the shoulder level (C)		
Chest	Pushup progression from wall to table to knees to toes (Figure 1 A-D)	Flys initiated on weight machines and progressed to dumbbells or pulleys with the arm position not extending beyond the plane of the body	Decline chest press (A)
	Chest press on an incline or flat bench with weight machines, barbells, or dumbbells (A)		Dips

^a Letters in parentheses refer to the lettered parts of the corresponding color-coded areas of Figures 2 and 3.

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Figure 2. Green-light exercises

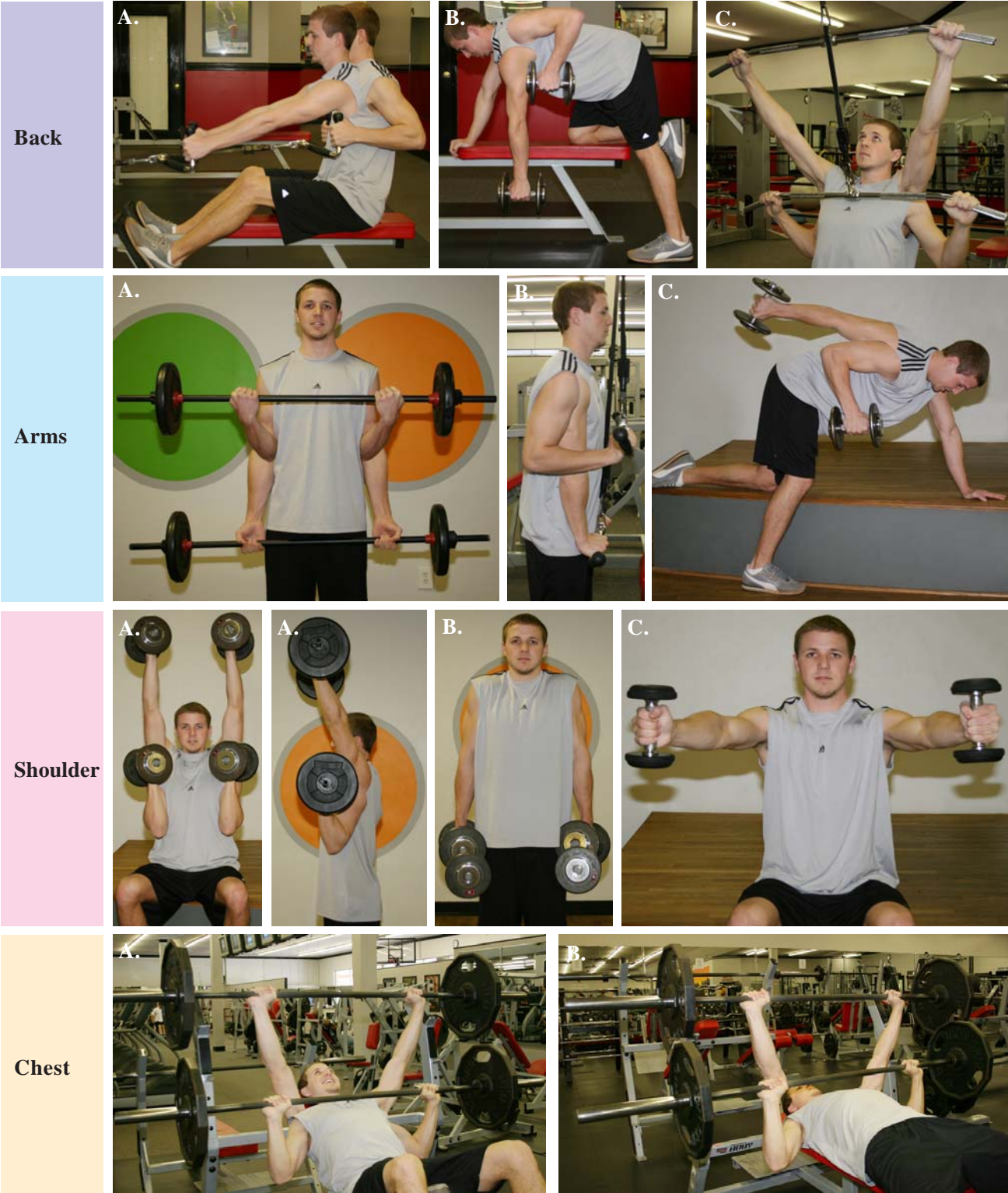


Figure 3. Red light exercises

