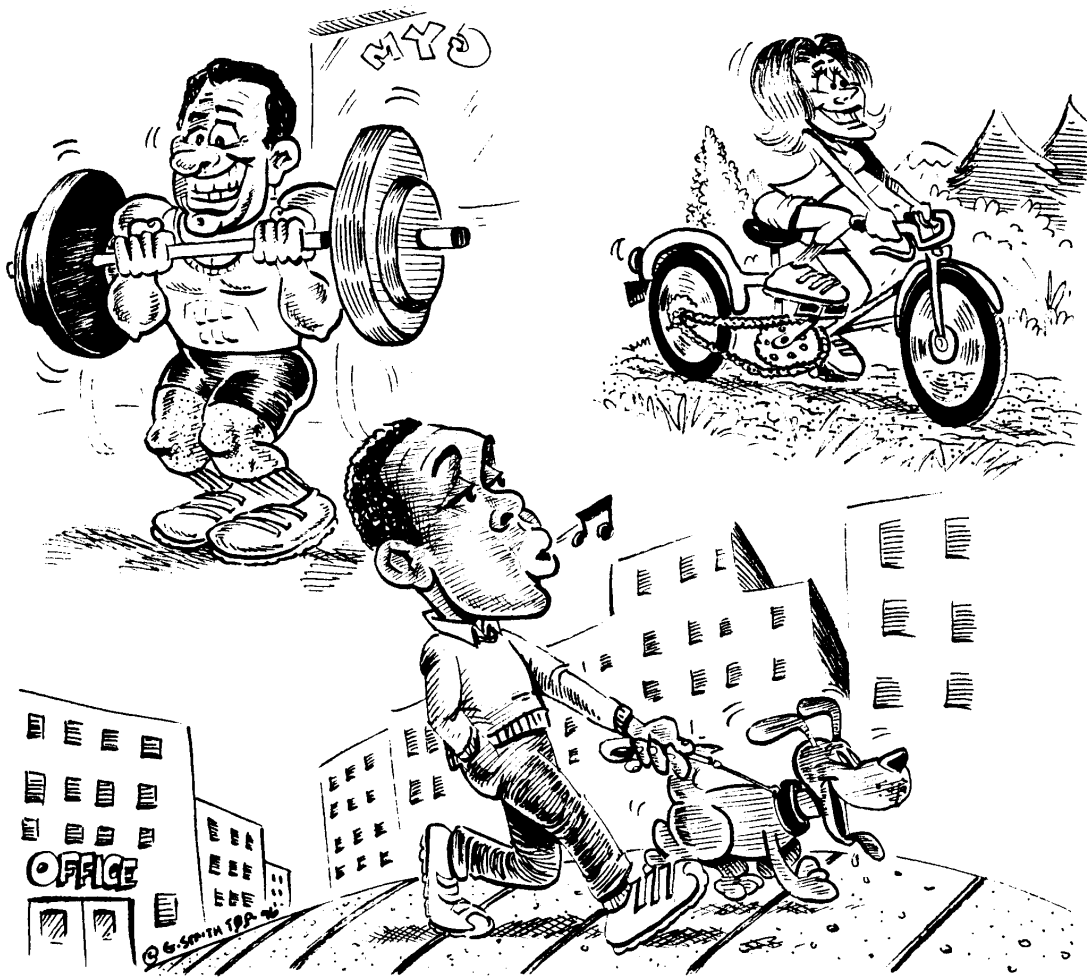


# Exercise and Stress







# Exercise and Stress

by Major Leo Mahony, MPT

The United States military services place great emphasis on the role of physical fitness and exercise training in combat readiness. We train to be physically and mentally capable soldiers, airmen, sailors, and marines. The military also recognizes the many health benefits of regular, moderate physical activity for all beneficiaries. Fitness contributes directly to substantial improvements in the quality of life.

Exercise and physical activity are powerful and readily available tools for preventing and treating symptoms of stress. The old adages “run for your life” and “burn off some steam” merit serious consideration. It is truly possible to walk, bike, run, lift, and stretch your way to a happier less stressful lifestyle. The first step is up to you: make a realistic activation plan for being more active.

## The Exercise-Stress Connection

Studies are beginning to show that physical activity enhances psychological well-being and relieves symptoms of depression and anxiety. Here are some of the factors involved:

1. Regular exercise helps one to feel in control. This sense of control over the body may translate to an improved sense of control over other aspects of life, a key defense against stress.
2. Exercise promotes well-being and relaxation. Regular exercisers demonstrate higher levels of self esteem and confidence and maintain a sense of self discipline. The individual acts upon the belief, “I am in charge of myself and can improve my health and fitness.”
3. Moderate physical activity is a natural, physiological outlet for a body in the “fight or flight” state of arousal frequently associated with stress. It cleanses the body of adrenaline, can lower the blood pressure, and relaxes tight muscles.

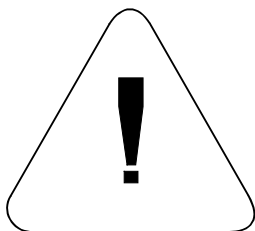
4. Exercise produces neurotransmitters called endorphins in the brain. These are the body's own natural tranquilizers. Endorphins can make one feel calm and relaxed during and for up to three hours after moderate physical activity. This elevation in mood has been referred to as *the runners' high* but is also experienced by those involved in other forms of exercise.
5. Exercise can cause many people who are physically active to give up unhealthy and stressful habits that interfere with exercise. Smokers may cut down or quit because smoking hinders aerobic performance. Others may eat more nutritiously to improve performance. The chronically busy individual may "work in" a workout to increase energy, alertness, and productivity - clearly a sound business investment with ample rewards.
6. Exercise can be a group or solo activity. Some individuals seek and develop alliances with other exercisers, which may provide social support - another stress reliever. Others may prefer some private time to exercise alone to "clear the head." Still others prefer some of both, depending on mood and circumstances.

*People of all ages can realize these benefits!*

## Before Starting an Exercise Program



**Precautions:** Physical activity is an excellent stress management tool when used correctly and safely. However, an inconsistent (sporadic) or hasty ("too much too soon") program invites injury - from trauma to overuse - which can add to stress rather than alleviating it.



**Considerations:** Most adults do not need to be examined by a health care provider before starting a moderate-level physical activity program. Exceptions include: men over the age of 40; women over the age of 50; those with one or more cardiac risk factors; and those with signs or symptoms of cardiac, pulmonary, or metabolic disease. Programs for children should be age-appropriate so as not to exceed strength or coordination abilities, jeopardize normal growth, or pose a serious threat of injury or disability.

## Helpful Hints

**Start slowly.** Begin exercising at your current level and gradually increase the pace or the length of your workouts over time. A helpful “rule of thumb” for a safe progression is no greater than 10 percent increase in total weekly repetitions, resistance, distance, or time. Unfortunately, many exercisers must stop a program because of an overuse injury; they attempted “too much, too soon.” While some morning soreness after a workout is normal, anything beyond this or occurring longer than 24 hours is probably indicative of a hasty progression. Starting slow can be encouraging rather than discouraging.

**Set realistic goals.** Stop exercising your excuses and start exercising your body! Small steps taken today will help you achieve long-range goals, but it won’t happen overnight and it won’t happen if you don’t start! Daily walks, slow stretching, and a light toning routine can ease you into a realistic plan.

**Do it *now!*** Many extremely busy people do live healthy lifestyles and exercise regularly. The key is in making fitness a priority. *The commitment is the key.* Waiting until things are less stressful won’t work. Find an activity and/or routine that you like and get started! Make and keep an appointment with exercise. The most popular exercise time for the chronically busy is first thing in the morning, before the rest of the world tries to derail you.

**Write it down.** Many people obtain personal reward and additional motivation by documenting their health and fitness accomplishments. Fitness notes can be as simple as an exercise diary or as innovative as computer software programs that provide personalized feedback with flashy displays and printouts. The best method is whatever motivates you to be consistent.

**Stay on track.** Don’t get discouraged if you miss an occasional workout. We all have days where in spite of best intentions, we did not accomplish all our objectives. Injury, travel, and obligations may force a missed workout. In the context of a lifetime, several days or weeks off is no big deal but don’t take a month or two to resume your program. Reaffirm the priority of health and regular exercise and get back on track again as soon as you can.

**Enjoy yourself.** Working out is something you should enjoy and look forward to. Select a variety of activities that energize you enough to continue performing on a regular basis. Many people make exercise a family activity. This can be a great way to spend quality time with family or friends while establishing healthy habits that last a lifetime.




# Exercise Recommendations

## 1996 U.S. Surgeon General's Report on Physical Activity and Health


(U.S. Department of Health and Human Services, 1996, p. 4).

The Surgeon General has determined  
that lack of physical activity is  
detrimental to your health.

### Key findings

-  “Men and women of all ages benefit from a moderate amount of daily physical activity.”
-  “Physical activity need not be strenuous to achieve health benefits.”
-  “Additional health benefits can be obtained through greater amounts of physical activity.”


## 1995 Centers for Disease Control & American College of Sports Medicine Recommendation (Pate et al., 1995)

-  “Every US adult should accumulate 30 minutes or more of moderate-intensity physical activity on most, preferably all, days of the week.”

## Healthy People 2000 Exercise Goal

(U.S. Department of Health and Human Services, 1995)

(One of the Department of Defense's top five health goals)

-  “To increase to at least 30 percent the proportion of people aged 6 and older who engage regularly, preferably daily, in light to moderate physical activity for at least 30 minutes per day.”

# The Three Phases of a Workout

**Warm-Up** - Preparation of the body prior to an activity or exercise period through total body movements and stretching for approximately 5 to 10 minutes.

**Workout** - Activity with intensity and duration (time) to develop or maintain one or more categories of fitness (the “Stress Busters”, see page 5).

**Cool-Down (or Warm-Down)** - Gradual transition from moderate or vigorous activity to the normal state through total body movements and stretching for approximately 5 to 10 minutes.

## The “Stress Busters”

There are four broad categories of “stress busting” exercises: aerobic, muscular strengthening, muscular endurance, and flexibility. Each plays an important role in the prevention and treatment of stress-related disorders and contributes to a balanced physical fitness program.

### 1. Aerobic Exercises or Activities--

Strengthen your heart, lungs, and associated blood vessels and increase stamina.

### 2. Muscular Strengthening Exercises--

Increase strength and size (bulk) of muscles or groups of muscles.

### 3. Muscular Endurance Exercises--

Improve stamina (tone) of muscles or groups of muscles.

### 4. Flexibility Exercises--

Decrease muscle tension, improve flexibility of specific muscle groups, help maintain joint mobility, improve circulation, and help prevent injury.



# “Stress Buster” Program

**1. Aerobic Exercises or Activities** - Moderate physical activity or cardiorespiratory endurance exercise or sports.

## Prescription for Aerobic Exercise or Activity

*Frequency:* Three to seven days per week.

*Intensity:* 70 to 80 percent of your maximum heart rate or any activity burning 150 or more calories per day

*Time:* A minimum of 20 to 30 minutes of continuous or accumulated activity.

## Specifications



Should be done on most, preferably all, days of the week. Three (3) days is considered the minimum to achieve many of the health benefits.



May be done in a single session of 20 to 30 minutes or more or performed intermittently with time accumulated for 30 minutes or more (for example, in three sessions of 10 minutes each).



Should use large muscles and raise heart and breathing rates. The working muscles rhythmically contract and relax, stimulating increased blood flow through the heart, lungs, and blood vessels.



Use any one of the following methods to determine how hard you should exercise (intensity)—

- a. Perform **“Moderate”** level activities.
- b. Take the **“Talk Test.”**
- c. Monitor your **“Target Heart Rate.”**

## Discussion - The Three Suggested Methods of Determining Intensity

a. Perform ***“Moderate”*** Level Activities:

A wide variety of choices exist that offer practical alternatives to suit most lifestyles and physical conditions. Any bodily movement (exercise or activity) produced by muscles is considered moderate if it uses 150 calories of energy per day or 1,000 calories per week.

Select from the **moderate** (or **vigorous**) columns of the following suggested menu of activities:

Vigorous	Moderate	Light
Aerobic Dance	Basketball	Badminton
Bicycling	Calisthenics	Baseball
Cross-Country Skiing	Canoeing, Leisurely	Bowling
Hiking (Uphill)	Downhill Skiing	Croquet
Jogging	Field Hockey	Football
Jumping Rope	Fishing, Standing/ Casting	Light Gardening
Rowing	Handball	Golf (On Foot Or By Cart)
Running In Place	Home Care, General Cleaning	Housework (Vacuuming)
Stair-Climbing	Home Repair, Painting	Ping-Pong
Stationary Cycling	Mowing Lawn	Shuffleboard
Swimming	Racquetball	Social Dancing
Walking Briskly	Soccer	Softball
	Squash	Walking Leisurely
	Volleyball	
	Walking Moderately	

b. Take the ***“Talk Test.”***

While performing an aerobic exercise or physical activity—

- ♥ If you can converse somewhat breathy, you’re doing okay.
- ♥ If you can sing, you may need to step up the pace a little.
- ♥ If you can’t talk, slow down--you’re working too hard.

c. Monitor your ***“Target Heart Rate”***

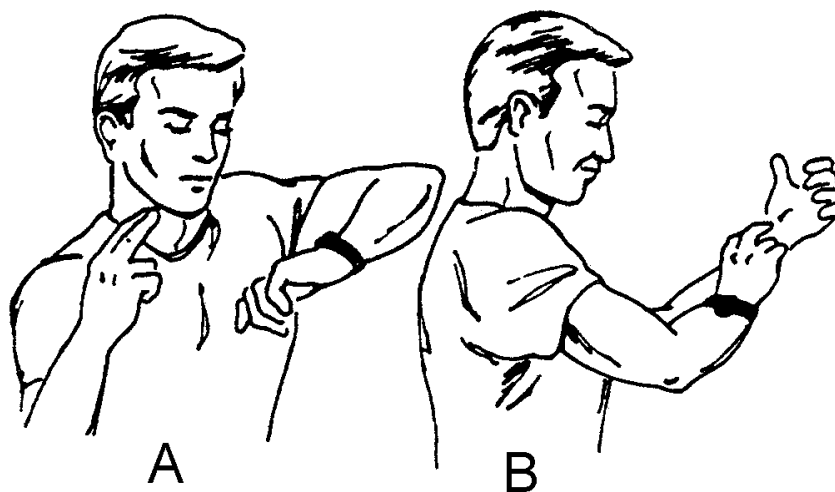
Your *Target Heart Rate* training range is based on a percentage of your body's maximal heart rate (MHR). Each time you do aerobics, your heart rate should reach and remain in the target heart rate zone appropriate for your age. This can be monitored during exercise by counting the pulse rate felt at the neck (carotid artery, see picture "a" below) or the wrist (radial artery, see picture "b" below) for 10 or 60 seconds.

Consistently exercising at an intensity above the moderate level target heart rate (or above the vigorous level in highly fit individuals) may put too much strain on your heart and cause you to stop, or can result in overtraining and exercise program "drop out." Regularly exercising below your moderate level target heart rate may not significantly strengthen your cardiovascular system, but the good news is "something is better than nothing."

Mounting evidence demonstrates that even small improvements in physical fitness can make a significant difference in the way our bodies handle stress. Additionally, many of the health benefits of exercise may be attained at intensities lower than previously thought.

You can quickly find your recommended *Target Heart Rate* for either 10 or 60 seconds by referring to the following chart.

## Determining Your Target Heart Rate



Age	Light Level*		Moderate Level		Vigorous Level	
	60 to 70% of MHR		70 to 80% of MHR		80 to 85% of MHR	
	10 sec	60 sec	10 sec	60 sec	10 sec	60 sec
19 and under	20-23	121-141	23-27	141-161	27-28	161-171
20-24	20-23	120-140	23-26	140-157	26-28	157-170
25-29	20-23	117-137	23-25	137-153	25-28	153-166
30-34	19-22	114-133	22-25	133-149	25-27	149-162
35-39	19-22	111-130	22-24	130-145	24-25	145-157
40-44	18-21	108-126	21-23	126-141	23-26	141-153
45-49	17-20	105-123	20-23	123-137	23-25	137-149
50-54	17-20	102-119	20-22	119-133	22-24	133-145
55-59	17-19	99-116	19-21	116-129	21-23	129-140
60 and over	16-19	96-112	19-21	112-128	21-23	128-136

\*Sedentary individuals may need to start at 50 percent MHR

### Sample: Basic Walking Exercise Program

Week	Distance (miles)	Time Goal (minutes)	Frequency/Week (sessions)
1	2.0	36.00	3-5
2	2.0	35.00	3-5
3	2.0	34.00	3-5
4	2.0	33.00	3-5
5	2.5	42.00	3-5
6	2.5	40.00	3-5
7	2.5	38.00	3-5
8	3.0	47.00	3-5
9	3.0	45.00	3-5
10	3.0	<43.00	3-5

(Advanced walkers typically progress to 60-minute sessions)

(Source: Cooper,1995)

To obtain an informative brochure about fitness walking, to include instructions for a home fitness walking test and five relative fitness level programs, see *Rockport Guide to Fitness Walking* in the suggested further reading section of this article.

## 2. Muscular Strengthening Exercises

### Prescription for Muscular Strengthening Exercises

*Frequency:* Two to three times each week.

*Intensity:* 60 percent of the One Repetition Maximum (1 RM) for each exercise.

*Time:* One or more sets of 10 repetitions for each exercise, targeting major muscle groups.

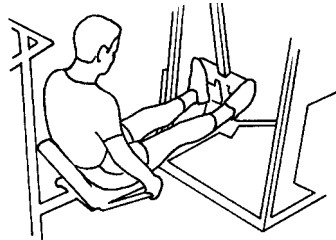
### Specifications

1. Perform at least 2 to 3 times each week (with 48 to 96 hours of recovery in between). Muscles grow by healing of microtrauma. The muscles must be given time to heal between workouts.
2. Determine the maximum weight you can lift correctly and safely one time (the 1 RM) for each exercise. The training weight will usually be 60 percent or more of this 1 RM, usually lifted in sets of approximately 10 repetitions.
3. Emphasize the major muscle groups: biceps, triceps, shoulder, chest, abdominal, back, quadriceps, hamstrings, and calf muscle groups.
4. Do one set initially, and work toward three sets if desired. Current theory speculates that almost 75 to 80 percent of the strength benefits may be obtained in one set done twice each week.
5. Use more resistance and fewer repetitions as you progress in strength.
6. Use the following for resistance:
  - Free Weights
  - Weight Machines
  - Rubber Band/Tubing
  - Calisthenics (uses body weight)
  - Partner Resisted Exercises

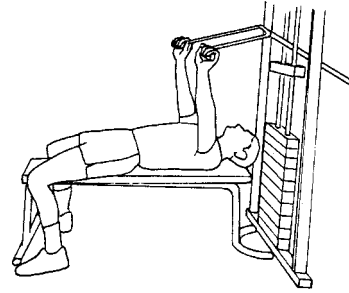
## Sample Basic Strengthening Exercise Program

(for Free Weights or Weight Machines)

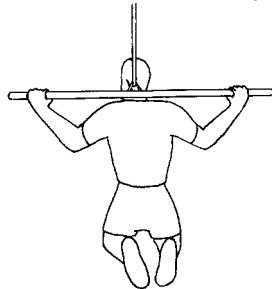
Leg Press  
(quadriceps, gluteus maximus)



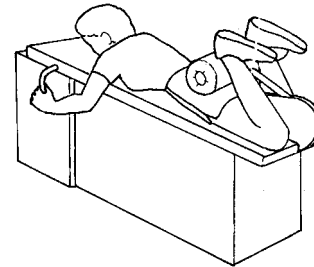
Bench Press  
(pectoralis major, anterior deltoid, triceps)



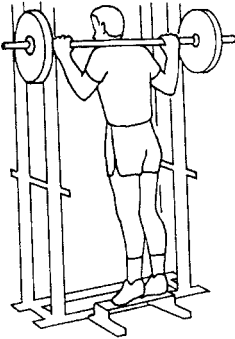
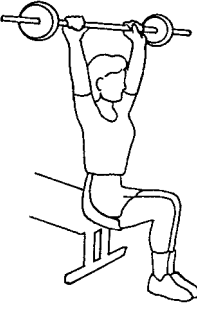
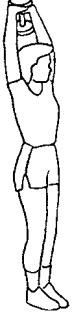
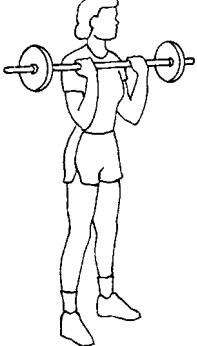
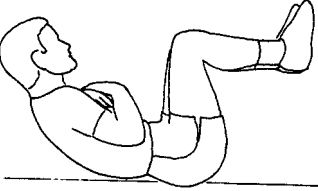
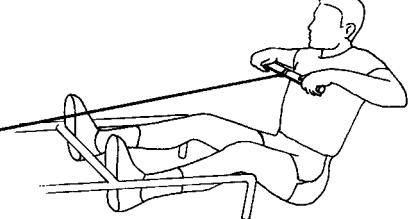
Latissimus Pull Down  
(latissimus dorsi, biceps)



Leg Curl  
(hamstrings)

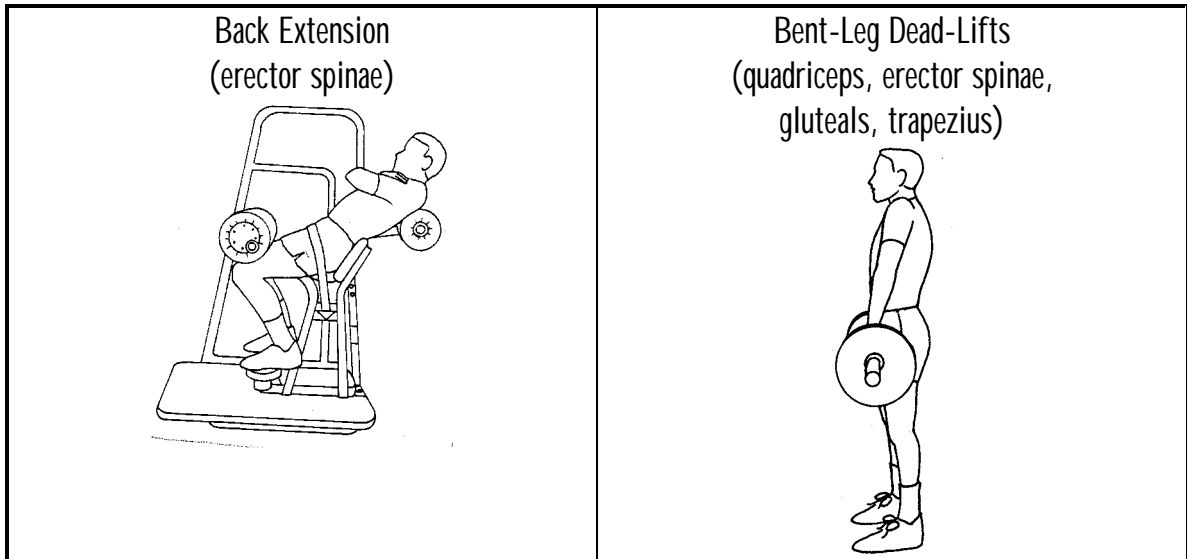


Sample Basic Strengthening Exercise Program (Cont.)  
(for Free Weights or Weight Machines)

<p>Calf Raises (gastrocnemius, soleus)</p> 	<p>Shoulder Press (triceps, deltoid)</p> 
<p>Triceps Press (triceps)</p> 	<p>Arm Curls (biceps)</p> 
<p>Abdominal Crunch (abdominal)</p> 	<p>Rowing (rhomboids)</p> 

## Sample Basic Strengthening Exercise Program (Cont.)

(for Free Weights or Weight Machines)



Source: Class Notes: Cooper Institute for Aerobics Research Physical Fitness Specialist Course and Physical Fitness Training, FM 21-20

### 3. Muscular Endurance Exercises

#### Prescription for Muscular Endurance Exercises

*Frequency:* Two to three times each week.

*Intensity:* 50 percent of the one Repetition Maximum (1 RM) or 50 percent of the number of repetitions done in one minute.

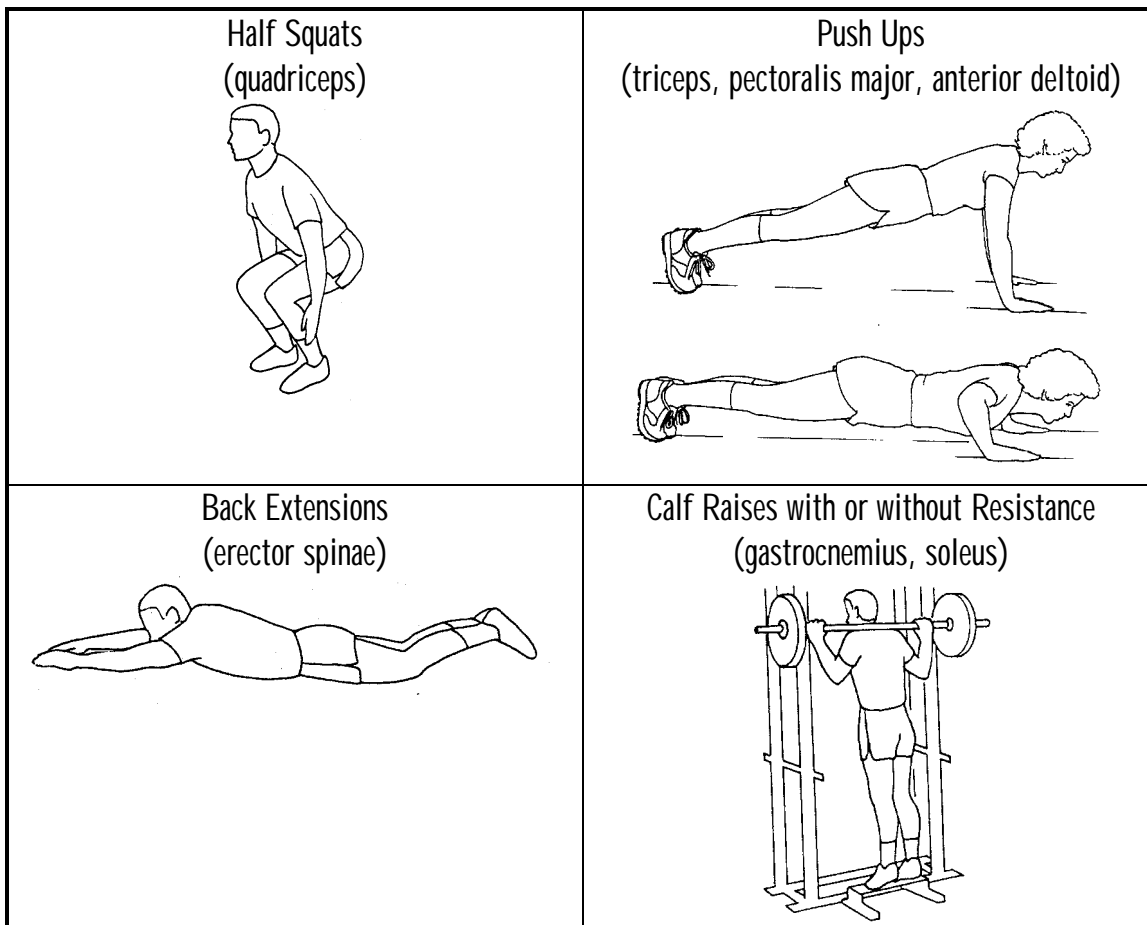
*Time:* One or more sets of each exercise targeting major muscle groups.

#### Specifications

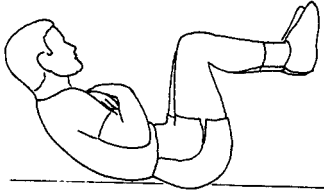
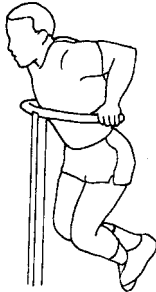
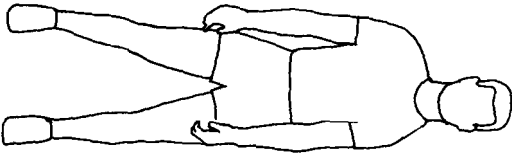
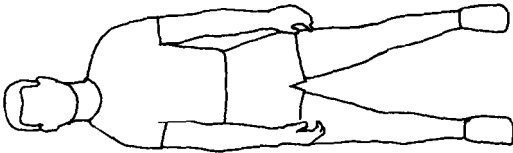
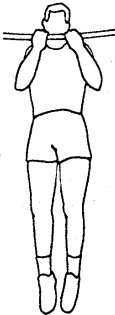
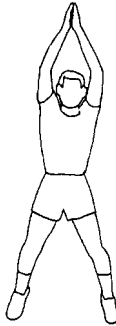
1. Perform at least two to three times each week.
2. Determine the maximum weight one can lift correctly and safely one time (1 RM).
3. Make the initial training dose  $\frac{1}{2}$  of this weight or  $\frac{1}{2}$  x number of exercises done in one minute.

4. Emphasize the major muscle groups (as in muscular strength).
5. Do one set initially and then work toward three sets.
6. Use the following for resistance:
  - Free Weights
  - Weight Machines
  - Rubber Band/Tubing
  - Calisthenics (uses body weight for resistance)
  - Partner Resisted Exercise

### Sample Basic Muscular Endurance Exercise Program (using Calisthenic Exercises)



Sample Basic Muscular Endurance Exercise Program (Cont.)  
 (using Calisthenic Exercises)

<p>Abdominal Crunches (abdominal)</p> 	<p>Dips (triceps, posterior deltoid)</p>  <p>May use two sturdy chairs.</p>
<p>Side Leg Lifts Right (gluteus medius)</p> 	<p>Side Leg Lifts Left (gluteus medius)</p> 
<p>Chin Ups (biceps, latissimus dorsi)</p> 	<p>Side Straddle Hop (long list of muscles)</p> 

Source: Class Notes: Cooper Institute for Aerobics Research Physical Fitness Specialist Course and Physical Fitness Training, FM 21-20

**4. Flexibility Exercises** - May be done for warm-up, cool-down, flexibility improvement, or whenever you are feeling stress, tense, stiff, or tired.

### Prescription for Flexibility Exercises

*Frequency:* Stretch before and after exercise or any physical activity. Also, stretch whenever you feel stressed, tense, stiff, or tired.

*Intensity:* Hold each stretch until tension is felt, not pain.

*Time:* Perform two or three repetitions of 10 or more seconds each.

## Specifications

When Done For Warm-up and Cool-down, Perform--



1. At every workout.
2. To prepare muscles for activity.
3. To promote healing of microtrauma in muscles.

When Done For Flexibility Improvement, Perform--



1. By identified individuals or those with perceptions of inflexible muscle groups.
2. Two to three times each week.
3. The most effective time is *after* a workout, when the muscles are truly warm.

When Done For All Flexibility Exercises--



1. Hold each stretch until tension is felt, *not* pain. Never bounce!
2. Emphasize the major muscle groups (as in muscular strength).
3. Do specific stretches applicable to the specific sport or activity.

## Stretching Techniques

**Active Stretching**--Gentle movements in the available range of motion.

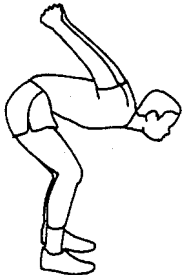
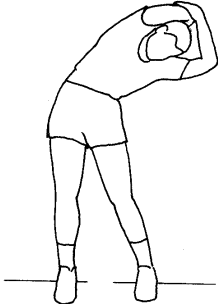
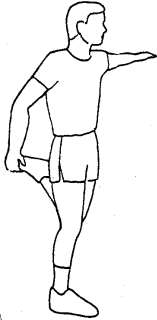
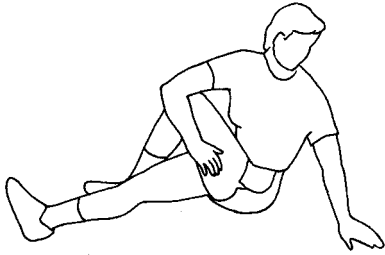
**Static Stretching**--Stretches should be held at the point of tension, usually at the end of the range of motion. Then, after the muscle relaxes, stretch to the new point of tension and hold at the new end of available range of motion.

**PNF Stretching**—Proprioceptive Neuromuscular Facilitation (PNF) involves more sophisticated stretching techniques such as hold/relax, which usually require instruction by a health care provider or master fitness trainer.

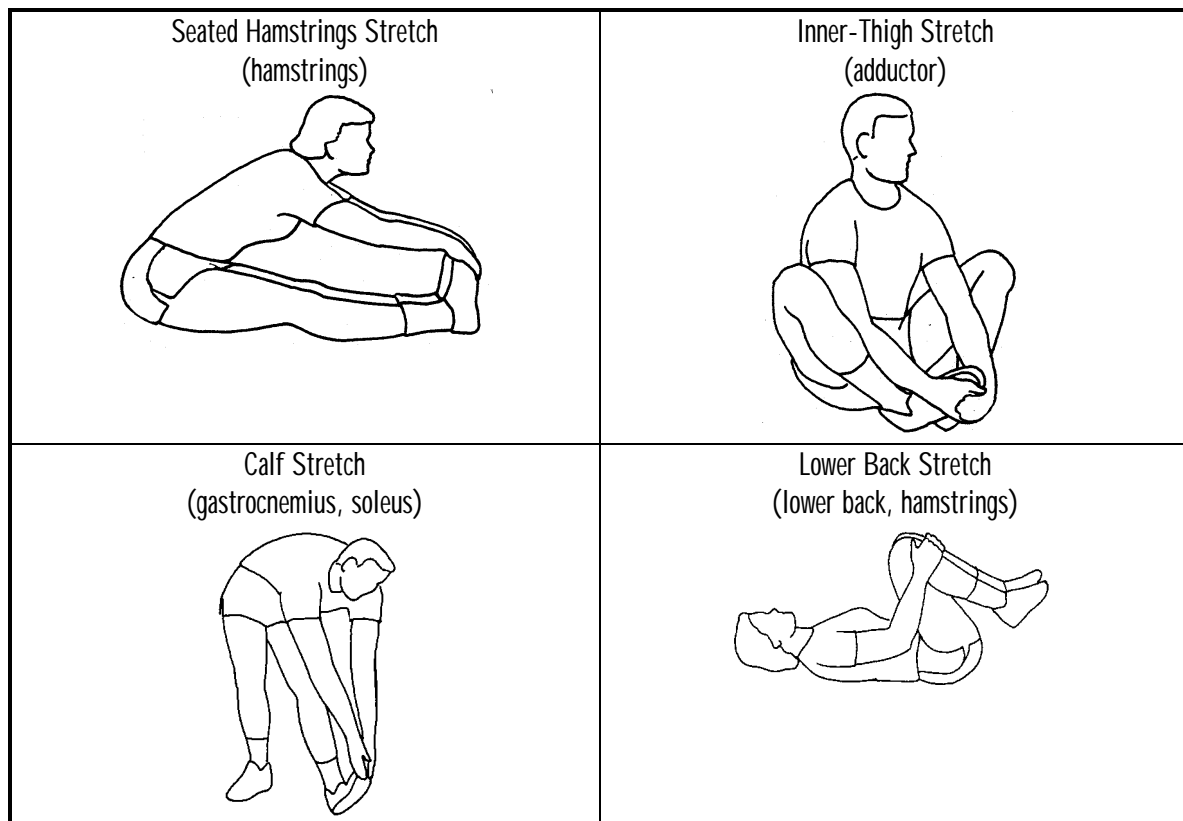
### General Stretching Guidelines

1. Hold each stretch for 10 to 20 seconds.
2. For flexibility improvement, hold each stretch 20 to 30 seconds or more.
3. Breathing should be slow and relaxed. **DO NOT HOLD BREATH!**
4. Do two or three repetitions of each stretch.

### Sample Basic Flexibility Exercise Program

<p style="text-align: center;">Chest Pull (pectoralis major, anterior deltoid)</p> 	<p style="text-align: center;">Side Bends (oblique, latissimus dorsi)</p> 
<p style="text-align: center;">Thigh Stretch (quadriceps)</p> 	<p style="text-align: center;">Hip and Back Stretch (hip abductors, erector spinae, latissimus dorsi, and obliques)</p> 

## Sample Basic Flexibility Exercise Program (Cont.)



Source: Class Notes, Cooper Institute for Aerobics Research Physical Fitness Specialist Course and Physical Fitness Training, FM 21-20

## Daily Opportunities for Additional Exercise

In addition to your regular program, don't neglect the following opportunities:

1. Take the stairs instead of the elevator.
2. Take the longer route to the bathroom or photocopier.
3. Walk across the hall to speak with a colleague instead of picking up the phone.
4. Stand while talking on the phone.
5. Conduct a walking meeting.
6. Start a lunch-time walking group.
7. If you supervise others, "manage by walking around."
8. Walk or stair climb during coffee breaks.

9. Park a distance away from work instead of as close as possible.
10. Stretch while waiting in line.
11. Replace one television show each night with a brisk walk.
12. Hide the remote control.
13. Use an exercise bike or rowing machine while watching television.
14. When traveling, pack your running or walking shoes and use them.

*Be creative in finding a variety of ways to be active!*

## References

American College of Sports Medicine. (1992). *ACSM fitness book*. Champaign, IL: Leisure Press.

Anderson, B. (1980). *Stretching*. Bolinas, CA: Shelter Publications.

Anderson, B., Pearl, B., & Burke, E. (1994). *Getting in Shape*. Bolinas, CA: Shelter Publications.

Baily, C. (1991). *Fit or fat*. Boston, MA: Houton Mifflin.

Cooper, K. (1995). *It's Better to Believe*. Nashville, TN: Thomas Nelson, Inc.

Department of the Army. (1992) U. S. Army Field Manual No. 21-20: *Physical Fitness Training*. Washington, DC: Author.

Glover, B., Shepherd, J., & Glover, S-L. (1996). *The runner's handbook*. New York, NY: Penguin Books.

Pate, R. R., Pratt, M., Blair, S. N., Haskell, W. L., Macera, C. A., Bouchard, C., Buchner, D., Ettinger, W., Heath, G., King, A. Kriska, A, Leon, A. S., Marcus, B. H., Morris, J., Paffenbarger, R. S., Patrick, K., Pollock, M. L., Rippe, J. M., Sallis, J., & Wilmore, J. H. (1995). Physical Activity and public health: a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *Journal of the American Medical Association*, 273, 402-407.

U.S. Department of Health and Human Services. (1995). *Healthy People 2000: Midcourse review and 1995 revisions*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, p. 161.

U.S. Department of Health and Human Services. (1996). Physical activity and health: a report of the surgeon general. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.

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