Commander's Guide to Injury Prevention

Cardiovascular Endurance

Muscular Endurance

Muscular Strength

Flexibility

Readiness thru Health

Commander's Guide to Injury Prevention

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Comments pertaining to this report are invited & should be forwarded to:

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For Injury Prevention programs available in your local area please contact your local Physical Therapy Clinic or Health Promotion Coordinator.

What is a Workout?

A workout is 25% perspiration and 75% determination. Stated another way, it is one part physical exertion and three parts self-discipline.

A workout makes you feel better today than you were yesterday. It strengthens the body, relaxes the mind, and toughens the spirit. When you work out regularly, your problems diminish and your confidence grows.

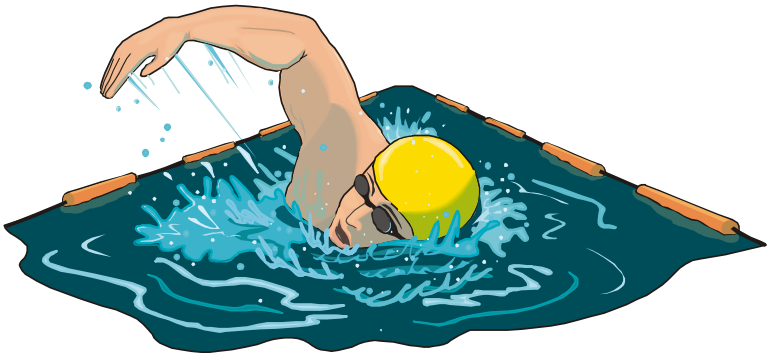
A workout is a personal triumph over laziness and procrastination. It is the badge of a winner - the mark of an organized, goal-oriented person who has taken charge of his/her destiny.

A workout is a wise use of time and an investment in excellence. It is a way of preparing for life's challenges and proving to yourself that you have what it takes to do what is necessary.

A workout is a key that helps unlock the door to opportunity and success. Hidden within each of us is an extraordinary force. Physical and mental fitness are the triggers that can release it.

When you finish a good workout, you don't simply feel better. . .

YOU FEEL BETTER ABOUT YOURSELF!



Exercise Evaluation & Analysis

QUESTIONS TO ASK YOURSELF WHEN MAKING A DECISION ABOUT EXERCISE

Exercise should be evaluated in terms of its purpose, effectiveness and risk of injury. It is easy to select exercises with low effectiveness or high risk. The real challenge is to select exercises that are both high in effectiveness and low in risk.

1. What is the purpose of the exercise?

2. Does the exercise achieve the stated goal? How effective is the exercise in meeting general and specific purposes?

3. What are the estimated risks involved? How frequently does the exercise cause injuries and how severe are the injuries?

4. Can participants perform the exercise using proper body mechanics?

5. Does the exercise train the function of the muscle (i.e., strength vs. endurance)?

6. Is the exercise appropriate for class participants? How can you adapt the exercise for different exercise levels?

7. Is there a better exercise choice for optimizing effectiveness and decreasing risk?

Improve APFT Scores
While Preventing Injuries

Run in ability groups!!

(Group soldiers based on their 2 mile run times)

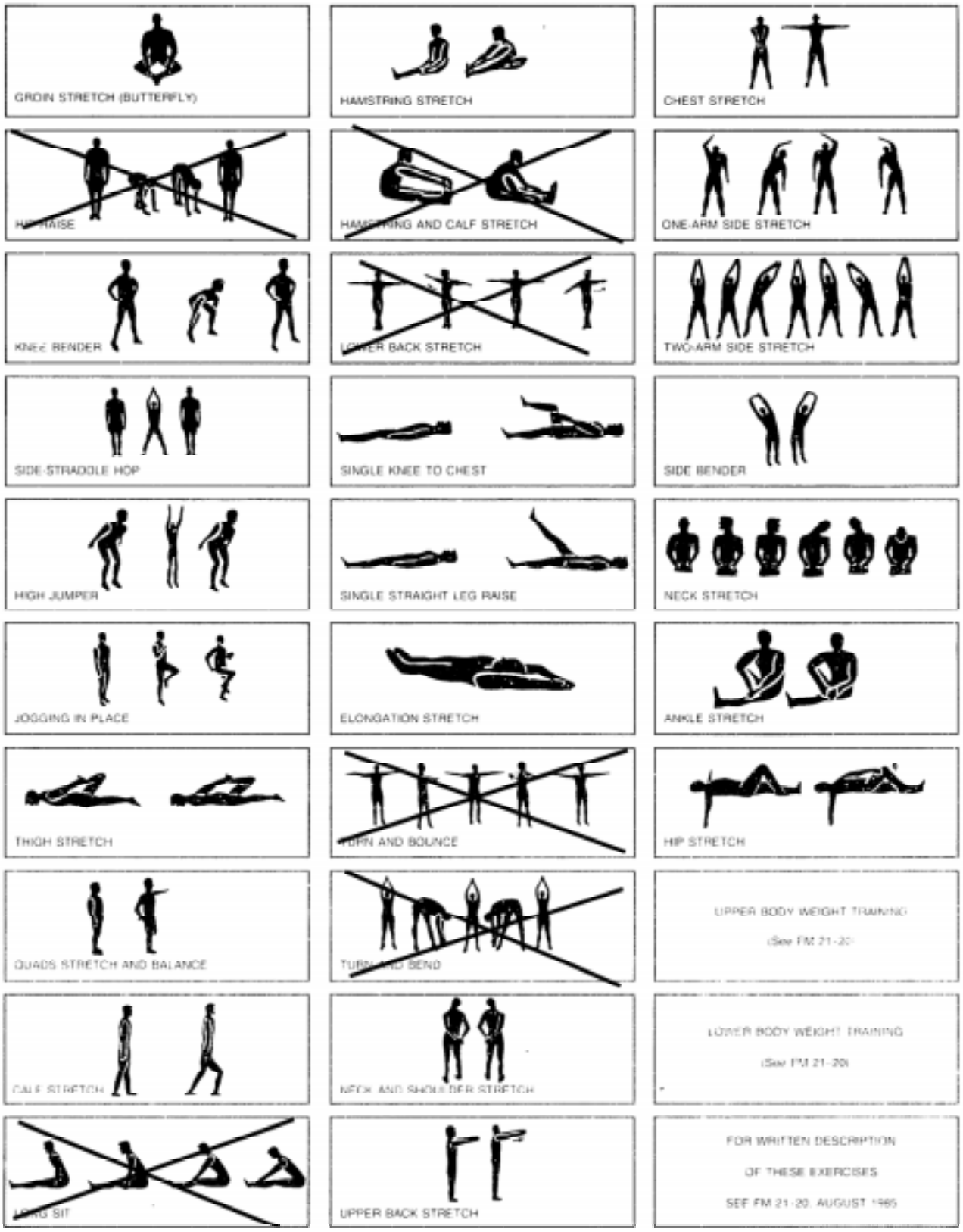
More groups = Better results

- Include warm-ups and stretching exercises
- Run every other day (not every day)
- Vary the type of running surface
- Increase the intensity and duration of exercise **gradually**
- Use alternate forms of training (bike, stairstepper, cross country ski machine, swim) instead of running or speed walking, especially for those on profile
- Running twice a day leads to overuse injuries, NOT improved APFT scores
- Exercise consistently during all training cycles
- Stretch (>20 second holds) after each exercise session

Emphasize **Battle Focused Physical Training**: train your unit based on its wartime mission, i.e., if strength is important, incorporate weight training into your program

Refer to FM 21-20

Physical Profile Form DA 3349



Exercise Recommendations

The following recommendations are from a physical therapy perspective and our experience in treating soldiers injured by specific activities. Recommended alternatives are given throughout this guide.

Exercises Recommended

- Run in ability groups!!
- Warm-up (run in place 2 mins) followed by stretching
- Exercise followed by stretching
- Back strengthening exercises
- Abdominal crunches, side bridges and hip raises instead of sit-ups
- Alternative cardiovascular workouts at gym (cross country ski machine, bicycle, stairstepper, cross trainer)

Exercises Not Recommended

- Excessive repetitions of any exercise (i.e., side straddle hops, knee benders)
- Daily long distance runs
- Flutter kicks; leg spreaders
- Sit-ups on hard surfaces; "rocky" sit-ups; excessive sit-ups
- Diamond or goal post/field goal push-ups
- Neck rotation
- Standing hamstring stretch (standing toe touch)
- As pictured on the back of the profile form: Hip Raise; Long Sit; Seated Hamstring combined with Calf Stretch; Lower Back Stretch; Turn & Bounce; Turn & Bend

"Physically fit soldiers can perform almost any type of exercise with little risk of injury. However, not all soldiers are fit and some may be prone to injuries. Therefore, not all exercises are recommended for all soldiers." -----US Army Physical Fitness School

The Warm-Up

Purpose of the Warm-Up: To prepare the body for more intensive exercise

Physiological Benefits of a Proper Warm-Up

- Increased blood flow to muscles
- Increased rate of oxygen exchange between the blood and muscles
- Increased metabolic rate, therefore, you burn more calories
- Increased muscle flexibility
- Increased force and speed of muscle contraction
- Rehearsal effect (the body prepares itself for the muscular patterns to be used later)
- Reduced stress on the heart
- Reduced injury rate

Both competitive and recreational athletes often make the mistake of equating the words "warm-up" and "stretching". Although stretching exercises can be included in the pre-workout routine, the most important goal when preparing to exercise should be to increase the body temperature and to prepare the muscles, connective tissue, and circulatory system to safely accommodate more intensive exercise.

How to Warm-Up

To warm up, you must perform a physical activity. Hot baths, saunas, heating pads or massages **do not work** because they raise only the body's **surface** temperature. Alterations in chemical, neural and cellular muscle function are dependent on changes in the body's **deep core** temperature. Therefore, the above methods do not work. The U.S. Army generally uses calisthenics to warm-up, however, the following are other methods used to prepare the body for exercise:

- Slow jogging or swimming
- Stationary bicycling or slow cycling
- Walking with exaggerated arm movements
- Low intensity, low impact aerobic dance routines
- Side steps with forehand and backhand swings (without the racquet)

A warm-up can be just a slower version of the upcoming exercise. Walk before jogging. Jog before running. Bicycle, row, or aerobic-dance at a slower pace than the actual exercise.

Depending on the exercise, you may need to do both overall and specific warm-ups. For example, weightlifters should warm-up the entire body first. A jog or fast walk to the weightlifting facility is a good general warm-up. If this isn't convenient, use a stationary bicycle, stairmaster, or treadmill. Five to ten minutes should be enough time for a general warm-up prior to weightlifting. Then warm-up specific muscles by using lighter weights for the first few repetitions.

How much time you spend warming up depends on how hard you intend to exercise. If you jog at a relatively comfortable pace, such as a twelve-minute mile, then five minutes of fast walking is all you need to warm-up. An elite athlete who is about to race at a five-minute mile pace needs at least fifteen minutes of moderate running to warm-up. In other words, the more intense the exercise, the longer you need to warm-up.

Stretching

Stretching cold can be more harmful than not stretching at all. The best time to stretch is after cardiovascular exercise or a muscular workout when the body temperature is elevated. The goal of stretching is to optimize joint range of motion while maintaining stability in the joint. It is crucial to do the stretches correctly to avoid injury.

Benefits of a Proper Stretching Program

- Improves posture and body symmetry
- Increases range of motion for each joint
- Minimizes low back pain
- Minimizes muscle soreness
- Promotes relaxation and reduces anxiety

General Rules for Stretching Safely

Stretching involves gradually going into a position that lengthens the muscle until tension is felt. For this to occur, the stretch must be held for at least 20-30 seconds. Anything less than 20 seconds will only serve to maintain what you have, which, in most cases, is not enough.

Avoid Quick Bouncing Movements

The momentum generated can cause damage to muscle, tendons and other tissues.

Avoid Locking any Joint

When stretching it is important to keep the knees and other joints "softened" to guard against unnecessary stretching or tearing of ligaments and connective tissue. Unlike muscles and tendons, ligaments are not meant to be stretched as this can decrease joint stability.

Never Force a Movement

Do not place your body in unnatural positions and do not perform movements that cause discomfort. Muscles stretch best when relaxed. Many injuries can be attributed to tight muscles; therefore, stretching should always be an important part of any exercise program.

Guidelines for Increasing Flexibility

- Perform an easy warm-up to increase blood flow and tissue temperature
- Never stretch a cold muscle
- Never stretch beyond your personal range of motion
- Avoid ballistic (quick, bouncing) stretches
- Hold the stretch for at least 20-30 seconds
- Allow for individual differences and use modifications for tight muscles or inflexible/hyper-flexible joints

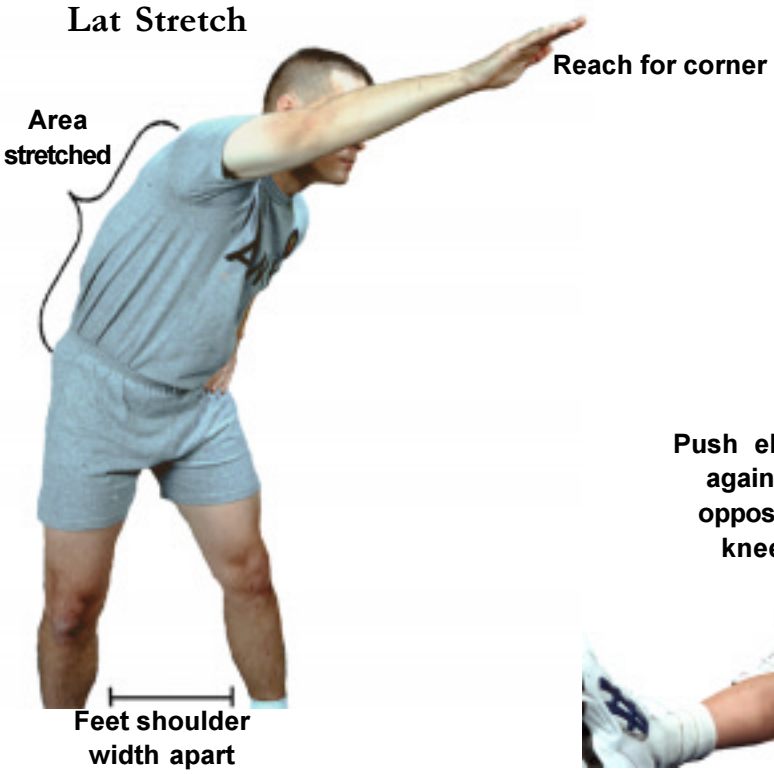
Final Stretch

The final stretch is the last segment of your workout and should consist of five to fifteen minutes of stretching and relaxation exercises. This will improve your flexibility and may reduce the chance of muscle soreness. Since your muscles and connective tissue are completely warm, it is okay to stretch using more tension than you did after your pre-exercise warm-up. Always release slowly from the stretched position. In addition to increasing or maintaining flexibility, this last segment serves as a final cool-down from the aerobic and muscular conditioning exercises.

Stretching should never be painful. If it is, then you are pushing it too far!!!

Upper Back Stretches

Lat Stretch



Upper Back Rotation

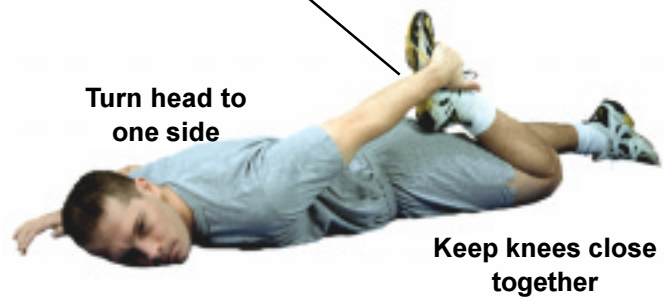
Posterior Shoulder Stretch

Triceps Stretch

Hip Flexor Stretches

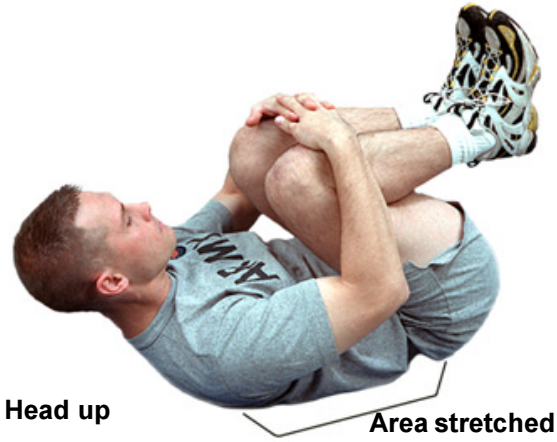
Quad Stretches

Alternate Position



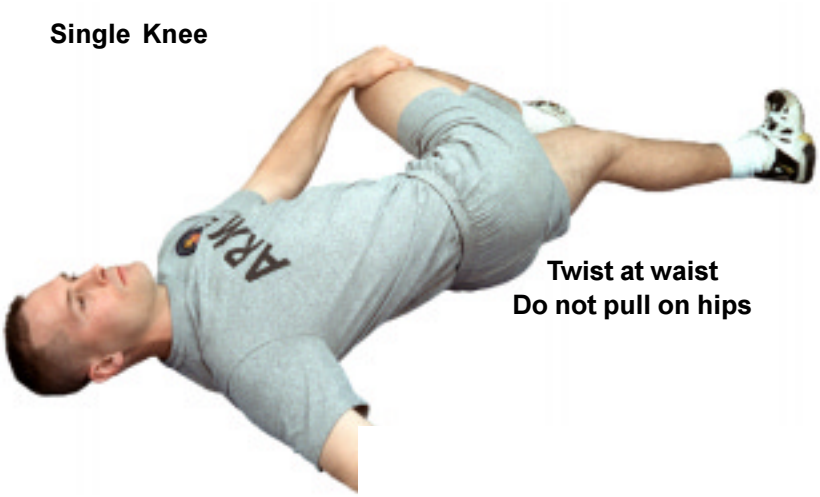
Lower Back Stretches

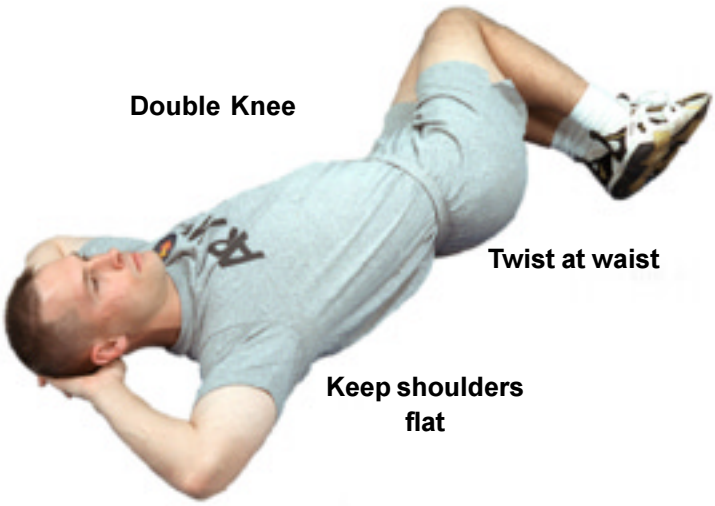
Double knee
to chest



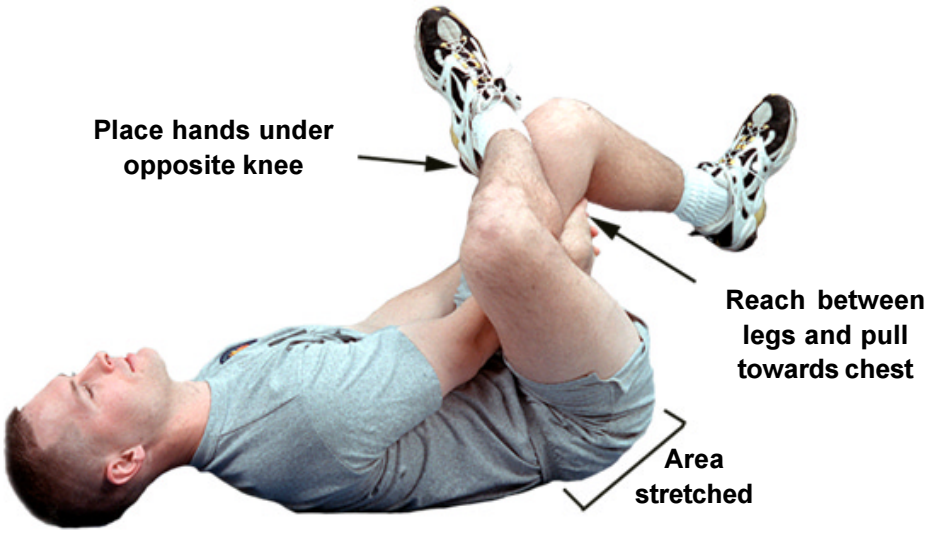
Hold all stretches 20-30 secs

Lower Back Rotations

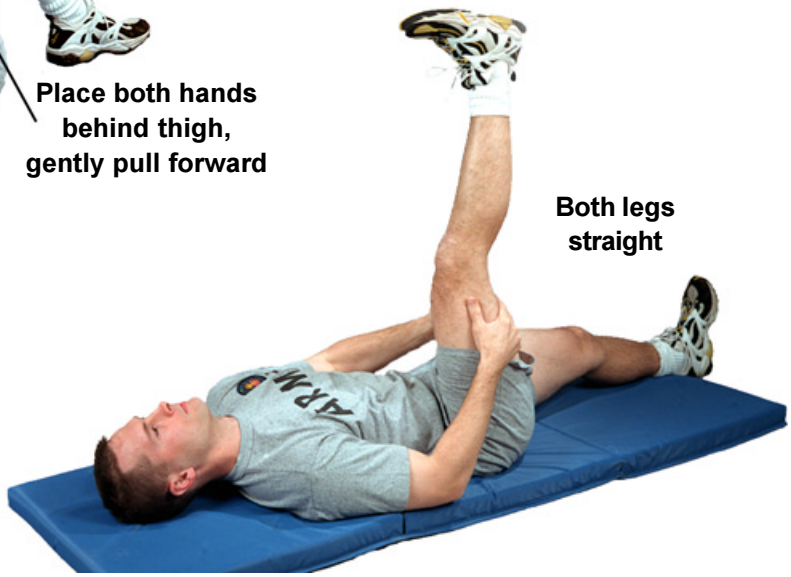




Hip Stretch



Hamstring Stretches

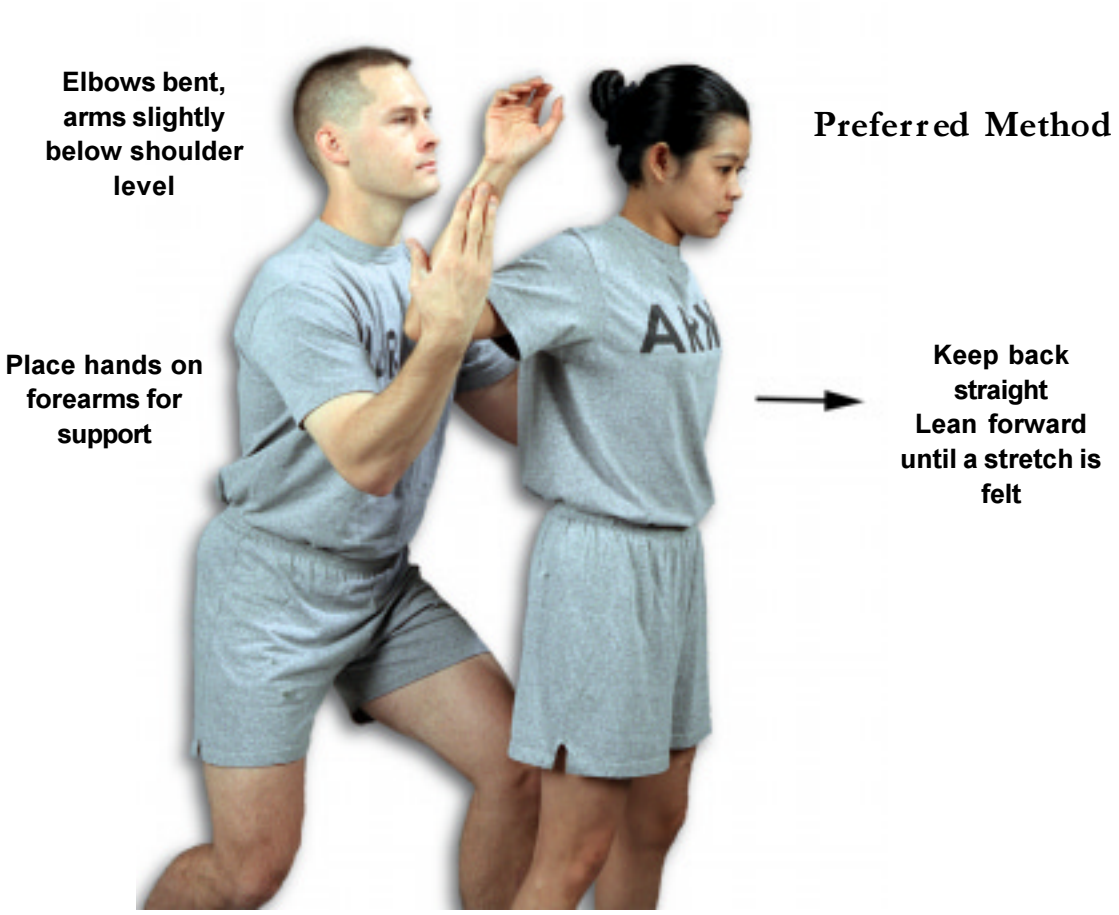


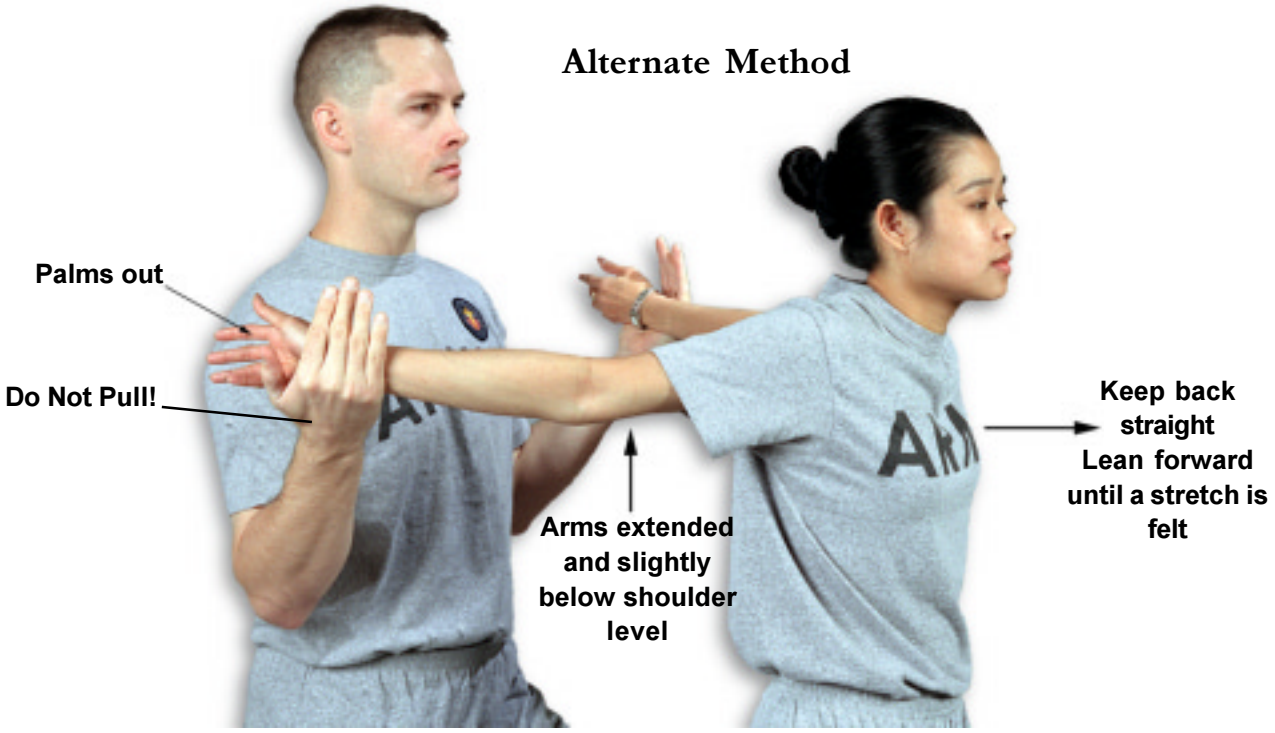
Partner Assisted Stretches

Hamstring Stretch

Calf Stretches

Partner Assisted Chest Stretches





Push-Up Recommendations

Push-ups are an important part of the Army's Physical Fitness Program, however, they put an intense load on the wrists. On healthy wrists, they generally do not pose any problems. However, push-ups on an injured or strained/sprained wrist can be debilitating.

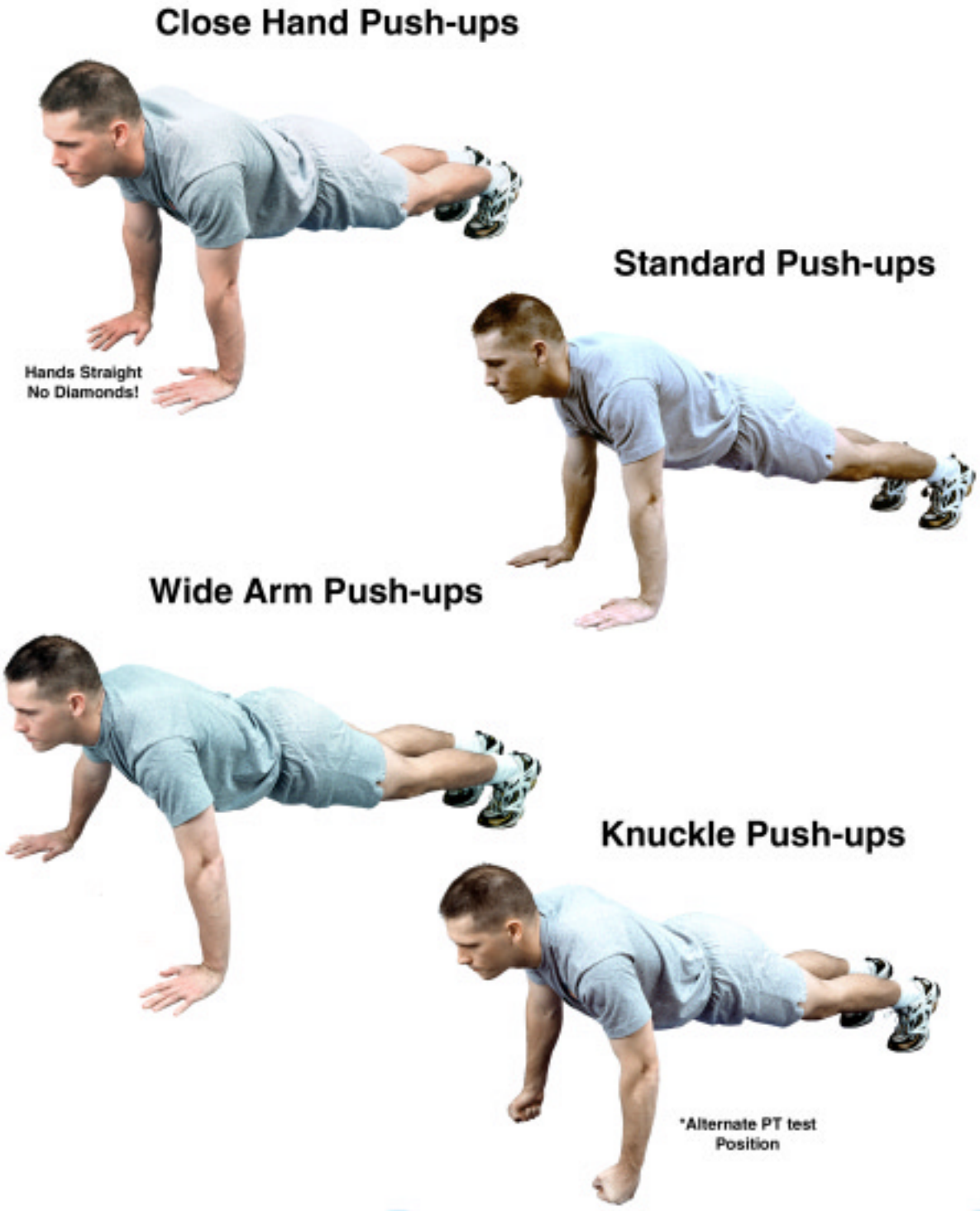
Hyperextension of the wrist while supporting the soldier's full weight puts the bones, ligaments, tendons, and nerves of the wrist in an abnormal and stressed position. These structures are not designed to withstand the constant load and forces sustained during the push-up exercise.

When the wrist is constantly pushed to muscle failure and/or is not given proper rest, the response is pain, swelling, and loss of motion. The final result is not being able to do proper push-ups or as many repetitions.

Some simple recommendations can help decrease, and in most cases eliminate, wrist pain associated with doing repeated push-ups:

- Do sets of push-ups instead of doing push-ups to muscle failure
- Frequently stretch and rest wrists between sets
- Alternate between close hand (not diamond), standard, and wide arm push-ups
- Do knuckle (fisted) push-ups
- If needed, tape wrists or use wrist supports to help stabilize the wrist and provide extra support

Push-Ups

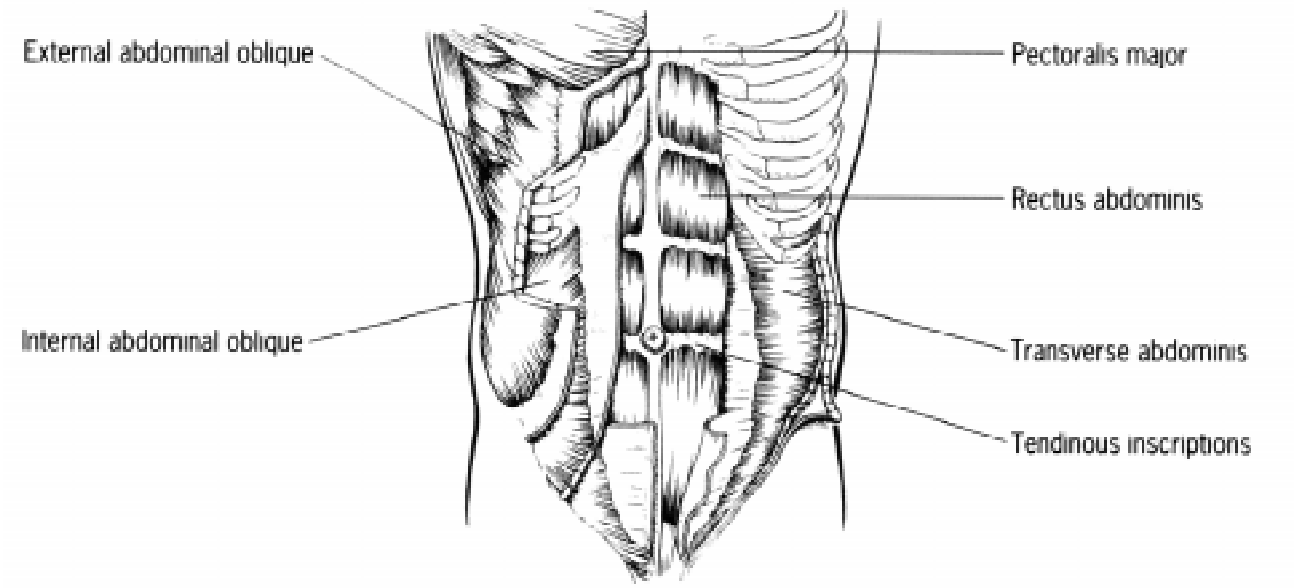

Close Hand Push-ups
Hands Straight
No Diamonds!
Standard Push-ups
Wide Arm Push-ups
Knuckle Push-ups
*Alternate PT test
Position

Sit-Up Recommendations

According to FM 21-20, Physical Fitness Training, "the sit-up event measures the endurance of the abdominal and hip flexor muscles." This statement can be misleading. The sit-up does measure the endurance of some of the abdominal muscles, however, it ignores other abdominal muscles that are probably even more important. In fact, most soldiers would say their legs are fatigued after two minutes of sit-ups, not their abdominal muscles.

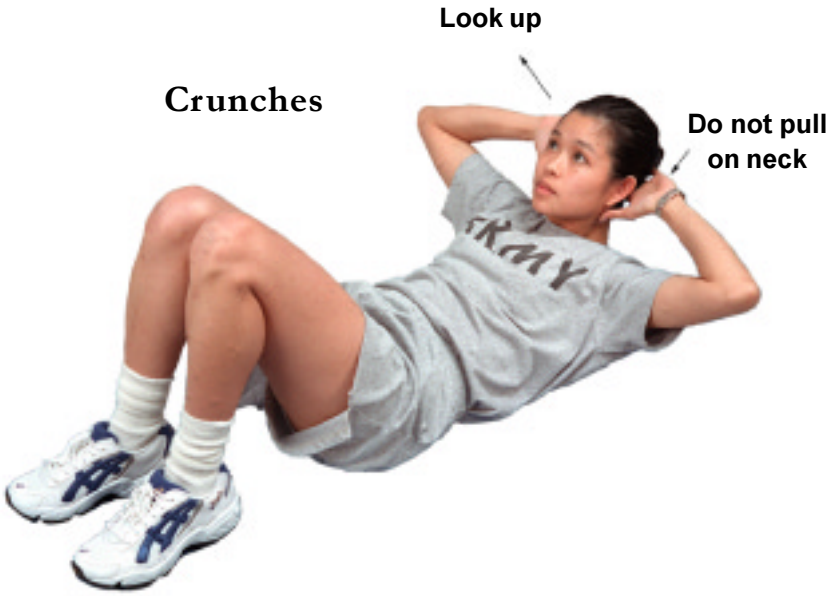
From the word "Go," soldiers are pulling their trunk off the ground and flopping back down as rapidly as possible. If this is the only training soldiers do for their trunk muscles, they are most likely ill-prepared to safely manage the forces acting on their spine each day. What can PT leaders do to exercise the abdominal & back (trunk) muscles that aren't challenged by the sit-up? Some examples follow. Perform each exercise in a slow, controlled manner with emphasis on precision of movement. Don't worry about repetitions. Instead, stop and change exercises when proper form cannot be held due to muscle fatigue.

Abdominal Muscles

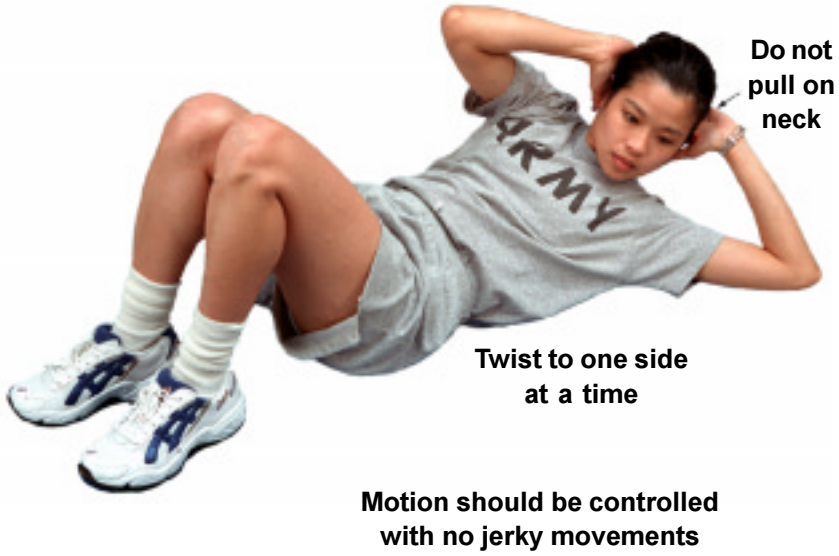


Sit-Ups

Crunches



Rotation Crunches



Soldiers should avoid doing these exercises on pavement, concrete, or gravel. When at all possible, use the grassy areas available or bring mats. By following these simple recommendations soldiers will avoid injuries to the tailbone.

Advanced Side Bridge

Start Position

Supine Hip Lift

Start Position

Move as a unit
Lift hips and hold

Move as a unit
Lift hips up
Extend one leg and hold

Back Strengthening

*Slow conrolled movements

1.

Keep back straight

Begin in kneeling position
Extend arm forward
Return to kneeling
Repeat

2.

Keep back straight

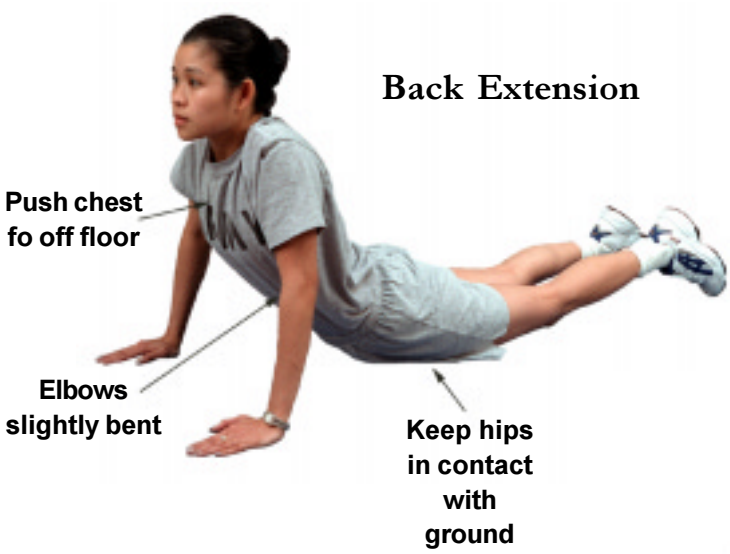
Begin in kneeling position
Extend leg back
Return to kneeling
Repeat

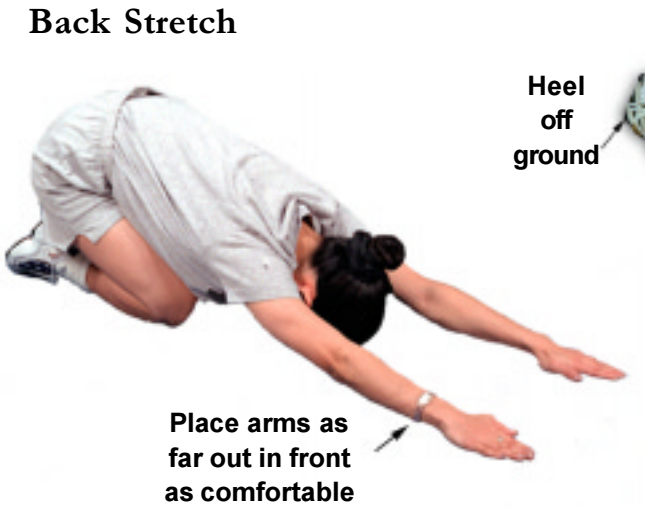
3.

Opposite arm & leg

Begin in kneeling position
Extend arm forward
Return to kneeling
Repeat

The following stretches are recommended after performing sit-ups and/or the previous exercises.





Aerobic Conditioning

Aerobic conditioning is vital to increasing fitness and decreasing the risk of injury. The criteria for cardiovascular conditioning includes using large muscle groups in a continuous, rhythmic and repetitive activity that is vigorous enough to reach your target heart rate for a minimum of 20 minutes. W hen designing an aerobic fitness program, incorporate the principles of **PROVERBS**:

Progression–maximum increase of 10% per week (10 miles 1 week, no more than 11 miles next week.)
Regularity–three to five times a week year round
Overload–incorporate fast continuous, fartlek and internal training (see next page)
Variety–crosstrain, do not run every day
Endurance–incorporate slow continuous training (see next page)
Recovery–include rest days
Balance–alternate between distance, speed and recovery days
Specificity–to improve in running, you must run; to improve in marching, you must march

Applying the FITT principle

Frequency: 3-5 times/week
Intensity: At your target heart rate
Type: **Primary cardiovascular exercises** are continuous, such as running, jogging, stairstepping, cycling, swimming, cross country skiing, and aerobics
Secondary cardiovascular exercises are those that start and stop, such as football, basketball, tennis, handball, raquetball, softball,volleyball and soccer.
Time: 20-30 minutes for primary (continuous) cardiovascular exercises
60-90 minutes for secondary (start & stop) cardiovascular exercises

Determining Your Target Heart Rate (THR)

220-age = Maximum Heart Rate (MHR)
70-90% x MHR = Target Heart Rate (THR)

Check your pulse by lightly pressing on the side of your neck at the carotid artery. Count the beats for 10 seconds and multiply by 6. This will give you your heart rate (beats per minute). While performing aerobic exercise, your heart rate should be within your target heart rate range.

Example: 20 year old
220-20=200 MHR
70% x 200=140
90% x 200=180
140-180 is your THR range

Types of Cardiovascular Training

Ability group runs should be incorporated as often as possible. Assign soldiers to groups based on their 2 mile run times from the most recent APFT. Each ability group should then run at a pace intense enough to produce a training effect for each soldier in the group. **The more groups, the better**.

Slow Continuous Training–running relatively long distances at a slow pace (70-75% of MHR) will develop cardiovascular endurance. This is commonly referred to as "Base Mileage."

Fast Continuous Training–continuous running for relatively long distances (80-85% MHR). These are commonly known as "Tempo Runs" that develop the soldier's ability to run a relatively fast pace for a longer period of time.

Interval Training–a series of repeated bouts of high intensity (85-90%MHR) exercise alternating with periods of low intensity exercise (<70% MHR).

Fartlek Training "Speed Play"–running, biking, swimming, etc; at varying intensities for an unspecified distance and speed. During fartlek training you alternate between high and low intensity.

Strength Training

Muscular strength and endurance are important for improving performance, training muscles, and preventing injuries. There are three different types of strength training:

1. Muscular Strength (MS): low repetitions, heavy weight
2. Muscular Endurance (ME): high repetitions, light weight
3. Muscular Strength/Endurance (MSE): A compromise between MS and ME

Applying the FITT Principle

Frequency: 3-5 times a week (vary muscle groups worked)
Intensity: Temporary Muscle Failure
MS: 3-7 Repetitions (2-3 sets)
ME: 12+ Repetitions (3-4 sets)
MSE: 8-12 Repetitions (3 sets)
Type: Free weights, calisthenics, machines, BFPT(Battle Focused Physical Training)
Time: Dictated by # of sets/reps and muscle groups worked

Types of Strength Training Routines

- Push-Pull Routine: push-pull muscles on opposite days
- Split Routine: upper/lower body on different days
- 3-Day Split: chest/biceps, back/triceps, legs

Types of Strength Training Equipment

- Isometric–immovable/static
- Dynamic Constant Resistance–free weights, calisthenics, real life performance tasks
- Dynamic Variable Resistance–weight machines

Key Training Points

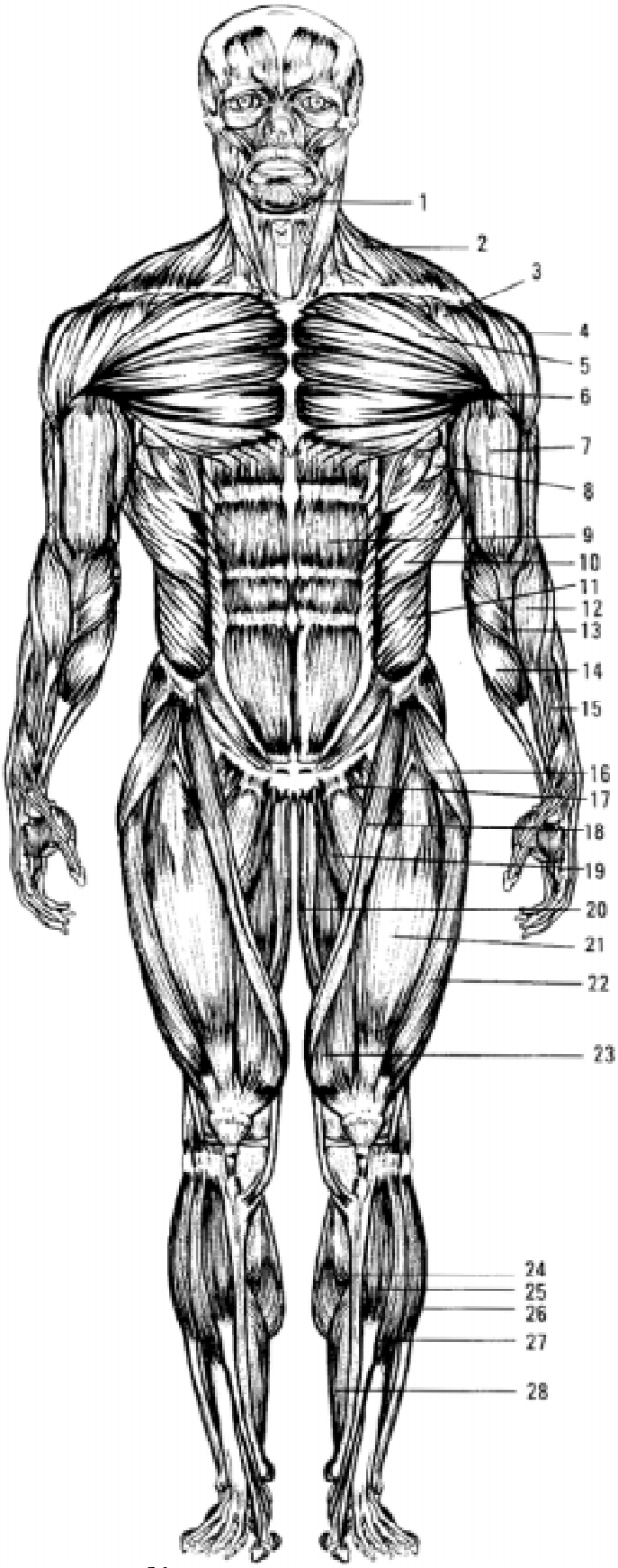
- Balance
- Breathing
- Strict form
- Controlled speed of movement
- Gradual progression
- Rest/recovery

General Strengthening Exercises

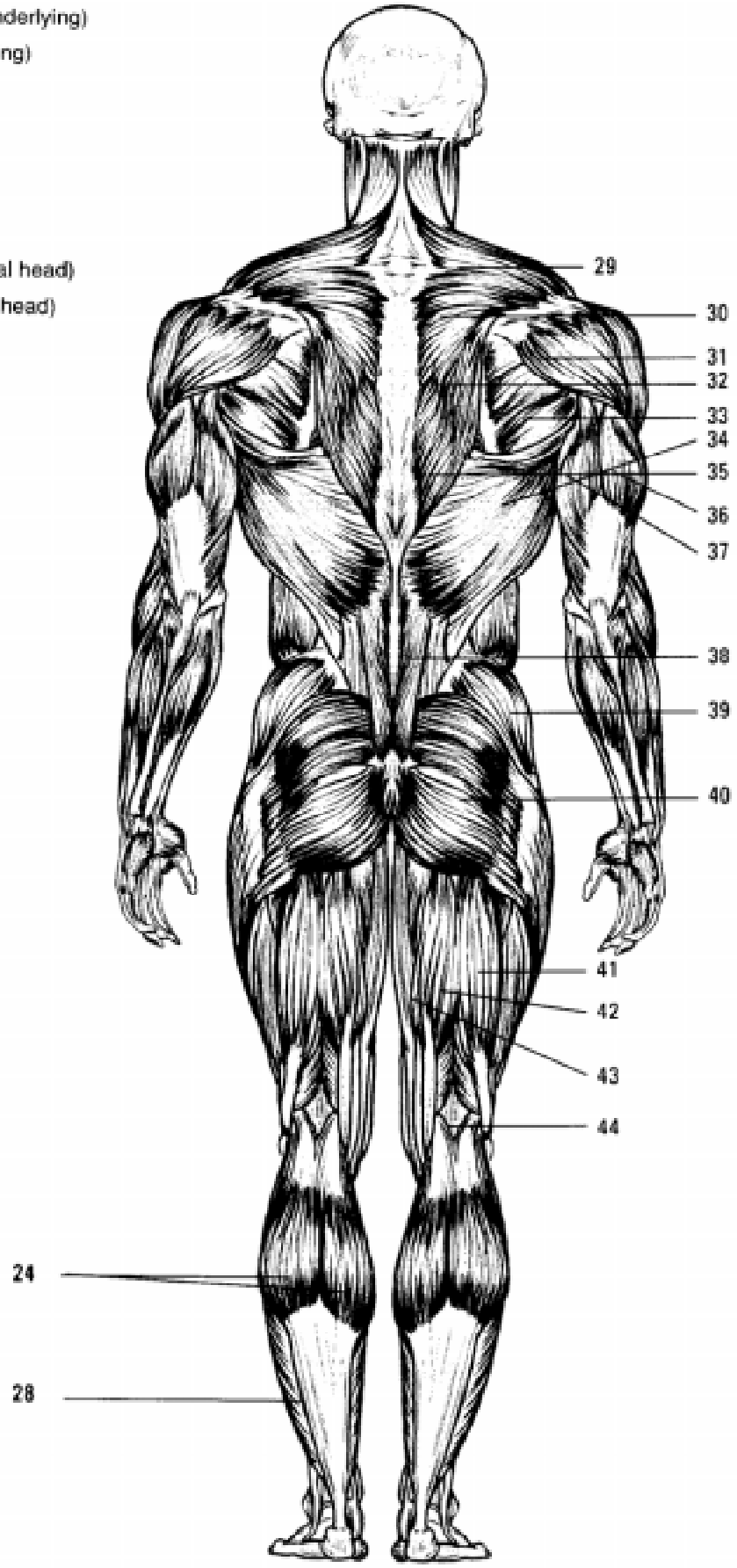
Exercise	Muscles Developed
Heel raises	Gastrocnemius
Seated heel raises	Soleus and Gastrocnemius
Toe raises	Tibialis Anterior
Knee bender, Lunges, Squats	Quadriceps, Hamstrings, Gluteus Maximus
Leg extension	Quadriceps
Leg press	Quadriceps, Gluteals
Leg curl	Hamstrings
Hip extensor machine	Gluteals, Hamstrings, Erector Spinae
Crunches	Abdominals
Rotation crunches	Oblique Abdominals
Side bridges	Abdominals, Erector Spinae
Supine hip lift	Abdominals, Erector Spinae
All fours, opposite arm & leg lifts	Erector Spinae, Hip muscles, Shoulder muscles
Roman chair	Erector Spinae, Gluteals
Lat pull down (palm away grip)	Latissimus Dorsi
Lat pull down (palm facing grip)	Latissimus Dorsi, Biceps
Bench press	Pectoralis Major, Triceps, Anterior Deltoid
Bench flys, Fly machine	Pectoralis Major
Bench/Seated row	Rhomboids, Trapezius
Upright row	Deltoids, Trapezius
Frontal raise	Anterior Deltoid
Lateral raise	Middle Deltoid
Overhead press	Deltoids, Trapezius
Bicep curl	Biceps, Brachialis
Tricep press	Triceps
Push-ups	Pectoralis Major, Triceps, Anterior Deltoid

The Muscles

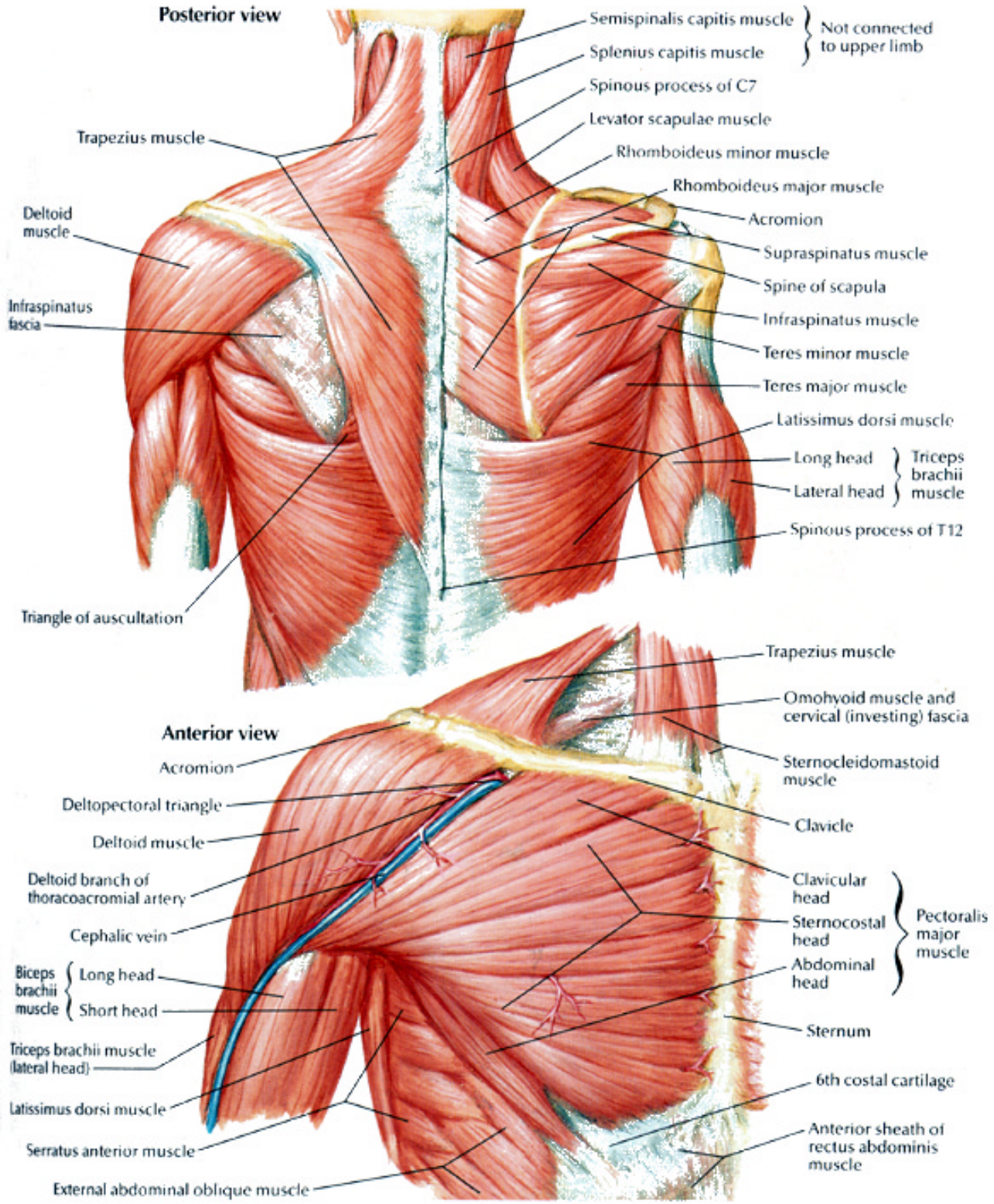
1. Sternocleidomastoid
2. Trapezius (upper)
3. Anterior deltoid
4. Medial deltoid
5. Clavicular pectoralis major
6. Sternal pectoralis major
7. Biceps brachii
8. Serratus anterior
9. Rectus abdominis
10. Internal oblique (underlying)
11. External oblique
12. Brachioradialis
13. Palmaris longus
14. Flexors
15. Extensors
16. Tensor fasciae latae
17. Pectineus
18. Sartorius
19. Adductor longus
20. Gracilis
21. Rectus femoris
22. Vastus lateralis
23. Vastus medialis
24. Gastrocnemius
25. Tibialis anterior
26. Peroneus longus
27. Extensors
28. Soleus



29. Levator scapulae (underlying)
30. Rhomboids (underlying)
31. Posterior deltoid
32. Trapezius (middle)
33. Teres major
34. Latissimus dorsi
35. Trapezius (lower)
36. Triceps brachii (lateral head)
37. Triceps brachii (long head)
38. Erector spinae
39. Gluteus medius
40. Gluteus maximus
41. Biceps femoris
42. Semitendinosus
43. Semimembranosus
44. Popliteus



Shoulder & Chest Muscles



Overhead Press

Start Position

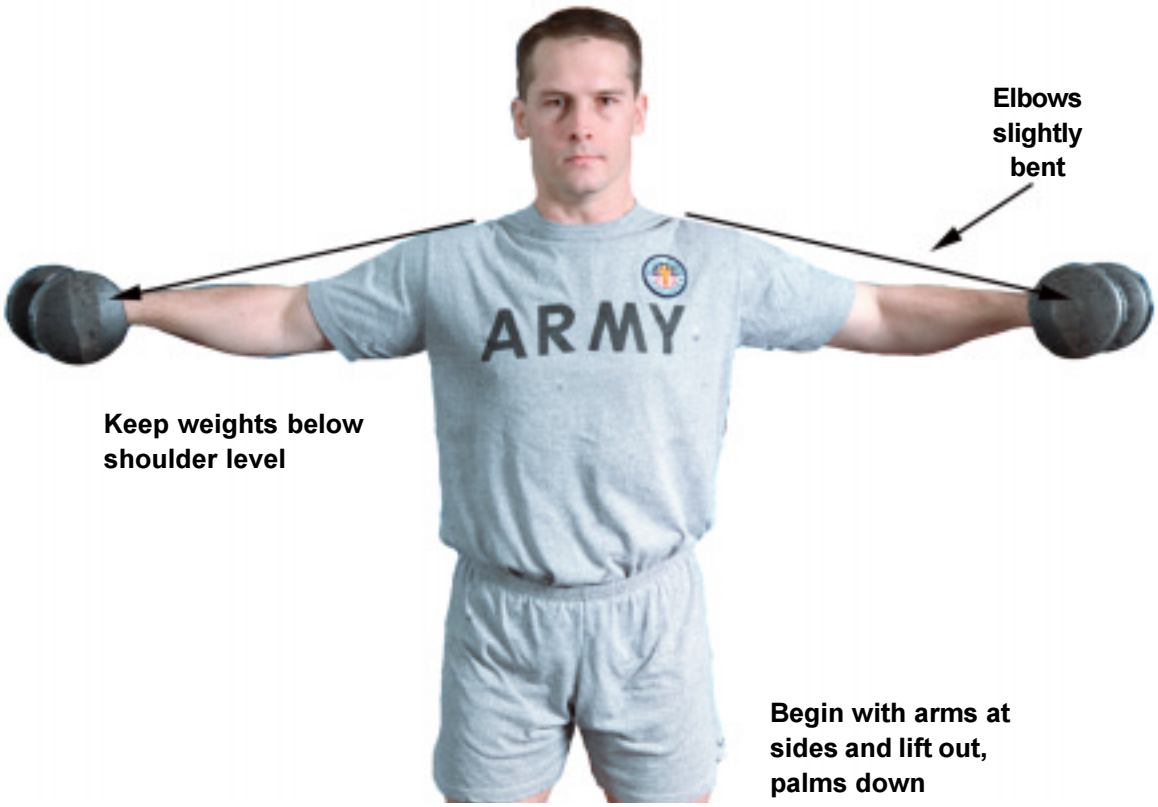
Should be able to see weights in front of you

Bring arms slightly forward

Extend arms so elbows are straight, but not locked

Keep back straight

Lateral Raises



Frontal Raise

Tricep Pushdown

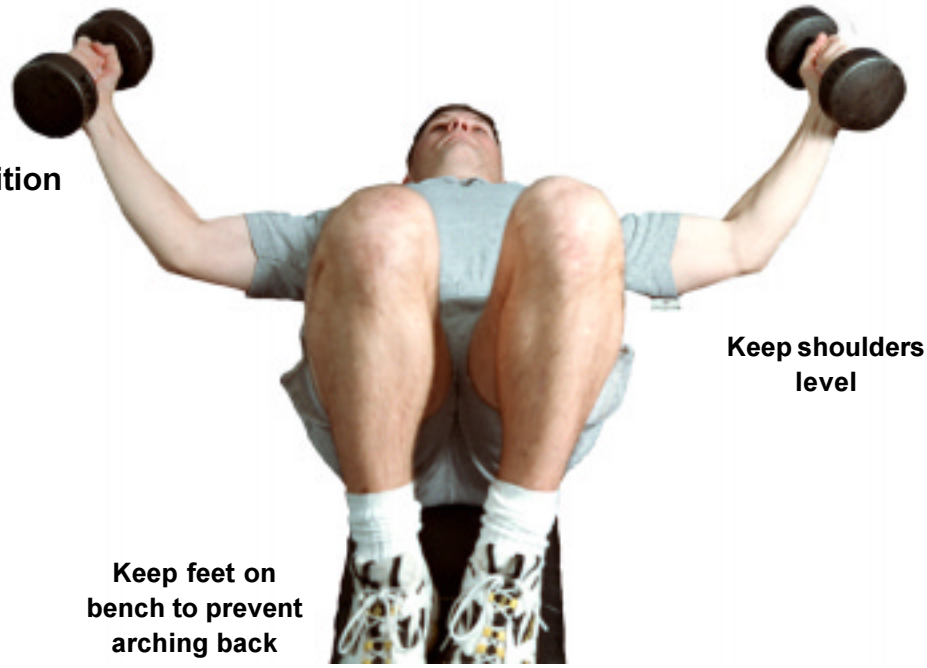
Start with elbows at 90 degrees

Keep back supported

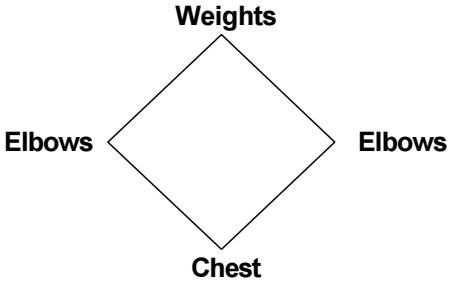
Push down until arms are straight

Upright Row

Bench Fly

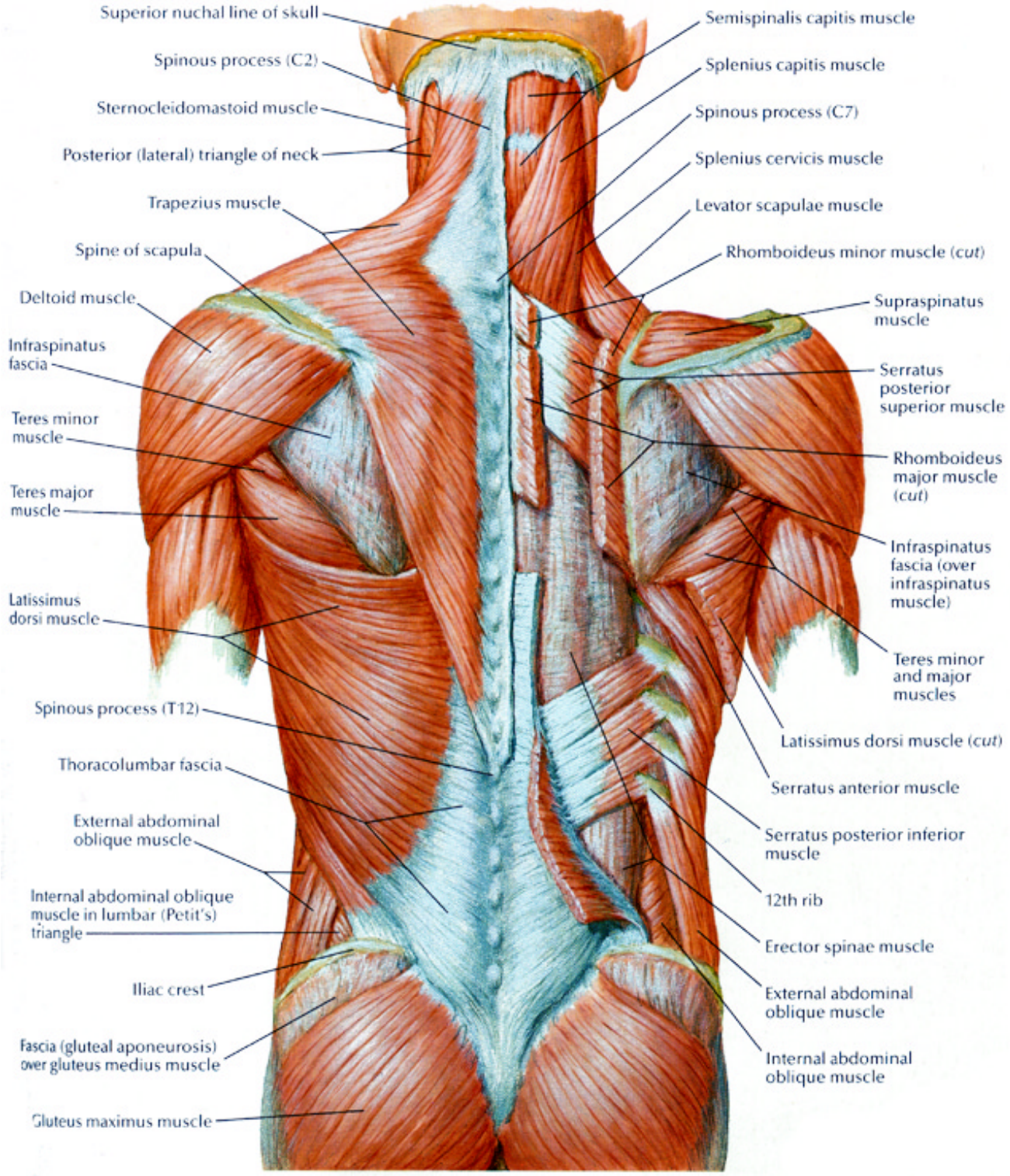


Finish Position



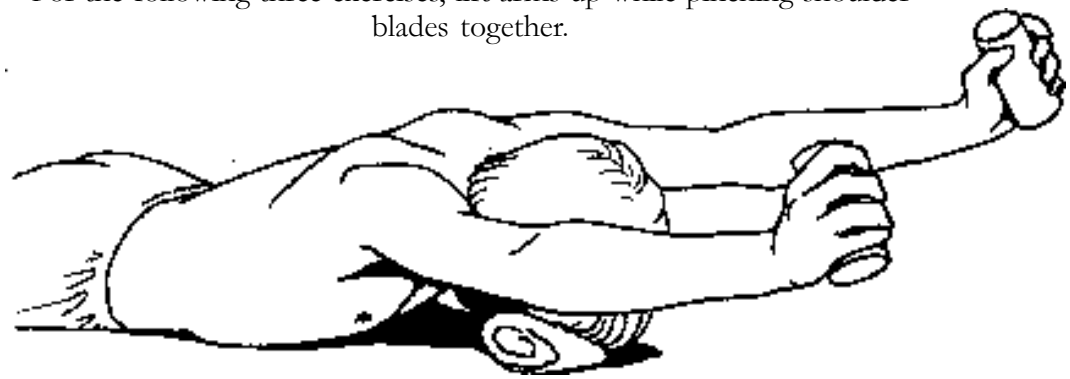
Fly Machine

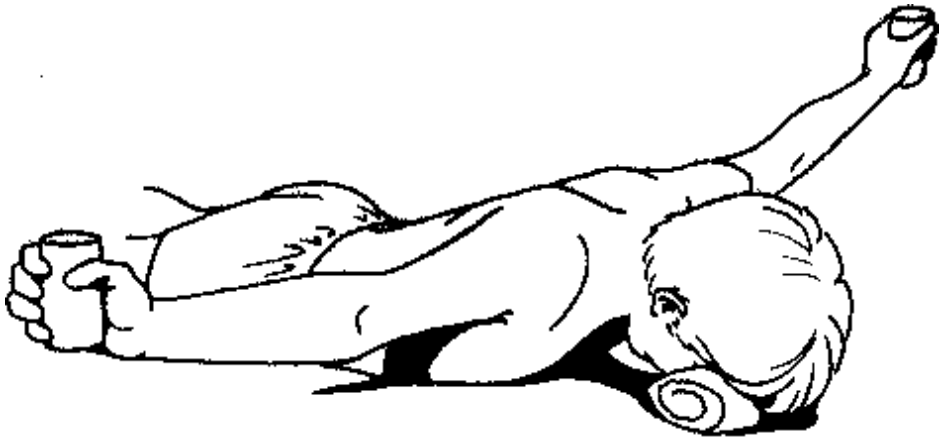
Back Muscles

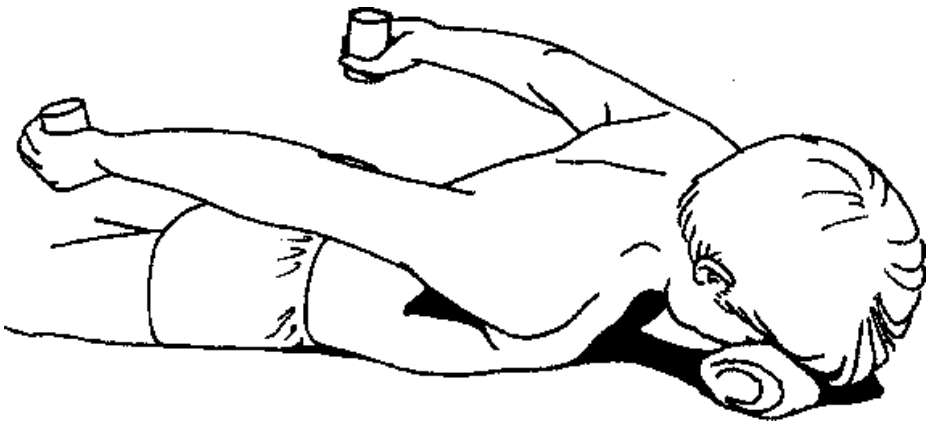


Mid/Upper Back Strengthening

For the following three exercises, lift arms up while pinching shoulder blades together.



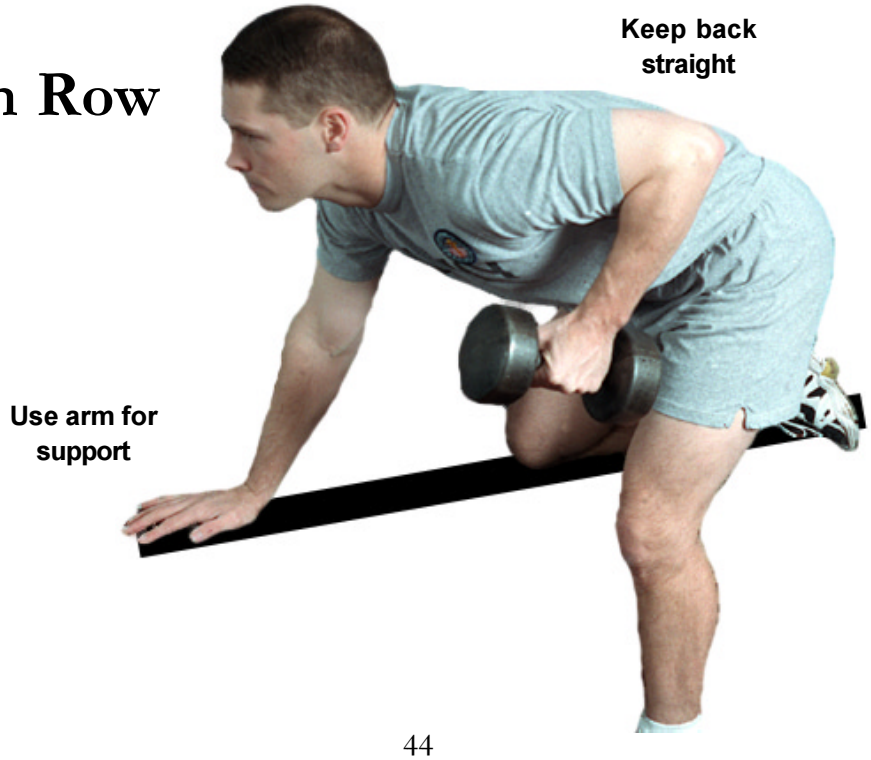




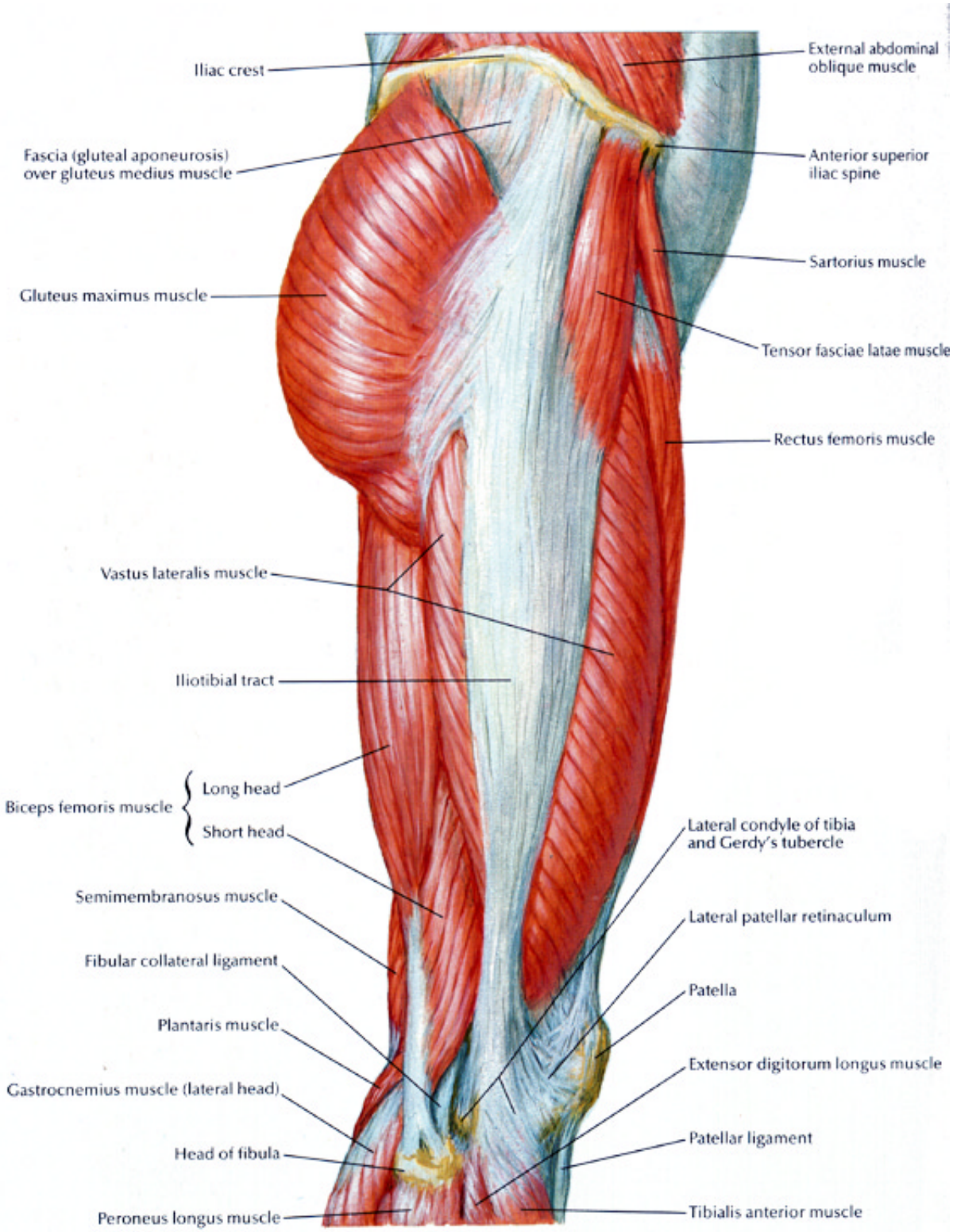
Lat Pull Down

Lat Pull Biceps

Bench Row



Leg Muscles


Iliac crest
External abdominal oblique muscle
Fascia (gluteal aponeurosis) over gluteus medius muscle
Anterior superior iliac spine
Sartorius muscle
Gluteus maximus muscle
Tensor fasciae latae muscle
Rectus femoris muscle
Vastus lateralis muscle
Iliotibial tract
Biceps femoris muscle
Long head
Short head
Lateral condyle of tibia and Gerdy's tubercle
Semimembranosus muscle
Lateral patellar retinaculum
Fibular collateral ligament
Patella
Plantaris muscle
Extensor digitorum longus muscle
Gastrocnemius muscle (lateral head)
Patellar ligament
Head of fibula
Peroneus longus muscle
Tibialis anterior muscle

Leg Press

Knee Extension

Leg Exercises

Knee Bender

Lunge

NOTE:
The lunge can be done without weights by simply alternating sides and going forward for a set distance. Do this exercise slowly. Concentrate on form not speed of movement.

Squat

Sample Workout Programs

Goal: 4 mile run

Warm-up:
- Jogging in place (1-2 minutes)
- Brisk walk with exaggerated arm movements (2-3 minutes)

Stretching: (Hold 20-30 seconds, 2-3 reps)
- Calf (with knee straight, and with knee bent)
- Quadriceps
- Hamstrings
- Hip Flexors

Exercise: 4 mile run (Run in ability groups)

Stretch/cool-down: (Hold 20-30 seconds, 2-3 reps)
- Same muscles as above

Goal: Strength Training

Warm-up:
- Calisthenics
- Side straddle hop (10 four-count reps)
- Arm circles–palms up (10 reps forward, 10 reps backward)
- Ski jumper (10-15 reps)

Stretching: (Hold 20-30 seconds, 2-3 reps)
- Shoulder muscles
- Chest muscles
- Abdominal muscles
- Leg muscles (quadriceps, hamstrings, hip flexors, calf muscles)

Exercise:
- Alternate between different types of push-ups (wide arm, standard, close hand) and different types of sit-ups (crunches, rotation crunches, side bridges, standard sit-ups)
- Incorporate strengthening exercises (lunges, squats, plyometrics)
- Plyometric exercises include the standing long jump, jump rope, ski jumper, cariokas, etc.
- Include back strengthening exercises

Stretch/Cool-Down: (Hold 20-30 seconds, 2-3 reps)
- Same muscles as above

Common Lower Extremity Overuse Injuries

Who Gets Injured?

1. Beginning runners-**ENTHUSIASTIC AND OUT OF SHAPE**
Run too often, too fast, or on hard surfaces wearing poorly made shoes

2. Experienced runners-**MOTIVATED TO ACHIEVE A NEW GOAL**
Incur overuse or stress injuries when increasing mileage too quickly

Running Levels–Correlates the level of running with the incidence of injury (100%)

Level 1: Jogger or recreational runner
3-20 miles/week, 9-12 minute miles
25% of the injuries
Level 2: Sports runner
20-40 miles/week, 7.5-8.5 minute miles
35% of the injuries
Level 3: Long distance runner
40-70 miles/week, 6.5-8 minute miles
35% of the injuries
Level 4: Elite marathoner
70-180 miles/week, 5.5-6.5 minute miles
5% of the injuries

Causes of Overuse Injuries

Training Errors–The majority of injuries are due to training errors
- Overtraining: NO PAIN ....NO GAIN = **NO GOOD**
- Inappropriate exercises
- No reconditioning period

Improper Running Surface–Slanted, uneven, or too hard
Shoes-Worn out or not designed for running
Foot Biomechanics-Flat foot or high arch
Muscle Tightness-Hamstrings, calf/achilles tendon, iliotibial band or piriformis
Muscle Weakness-Quadriceps (causes pain behind or around the knee cap)

Most injuries are due to overuse and training errors. If these two causes are corrected, medical intervention may not be needed.

Back Pain

Reasons
- Faulty running mechanics
- Poor foot biomechanics
- Leg length discrepancy (one leg is longer than the other)
- Poor posture (some muscles too tight and/or others too weak)
- Muscle imbalances (abdominal and/or back muscle weakness)

Treatment
- Change running form (trunk erect; arms, shoulders and neck relaxed; arms swing directly forward and back; elbows flexed no more than 90 to 100 degrees; hands held loosely)
- Change running surface (even, relatively level, non-banked running surface)
- Orthotic shoe inserts to compensate for pronation, supination, or leg length discrepancy
- Stretching/strengthening exercises, rest, ice, aspirin or NSAIDS (anti-inflammatory medication)

Anterior Knee Pain (PFS/RPPS)

Reasons
- Weak quadriceps
- Tight Iliotibial Band (ITB), lateral quadriceps, or other lateral soft tissue
- Tight hamstrings
- Poor foot biomechanics
- Excessive training/sports (running too far, too fast, too often)

Treatment
- Strengthen quadriceps
- Stretch ITB, quadriceps, and hamstrings
- Orthotic shoe inserts
- Avoid excessive knee bending (i.e. squats or prolonged sitting)
- Rest, ice, aspirin or NSAIDS (anti-inflammatory medication)

Lateral Knee Pain (Iliotibial Band Syndrome)

Reasons
- Tight Iliotibial Band (ITB)
- Bowlegged with pronated (flat) feet
- Leg length discrepancy
- Excessive hill running
- Running on slanted surfaces - always with same leg uphill
- Increasing frequency/duration/intensity of runs in a short amount of time

Treatment
- Stretch ITB
- Replace old running shoes
- Change running surface
- Orthotic shoe inserts
- Rest, ice, aspirin or NSAIDS

Jumper's Knee (Patellar Tendinitis)

Reasons
- Tight hamstrings and/or calf muscles
- Weak quadriceps
- Running and jumping on a hard surface (basketball)
- Hard downhill running
- Overtraining

Treatment
- Stretch hamstrings and calf muscles
- Strengthen quadriceps
- Rest, ice, aspirin or NSAIDS

Shin Splints

Reasons
- Tight calf muscles and/or weak anterior leg muscles
- Excessive pronation (flat feet)
- Running on hard or curved surfaces
- Worn out or improper shoes
- Increasing speed or distance too rapidly

Treatment
- Stretch calf muscles
- Strengthen anterior leg muscles–foot-tapping exercise
- Shoe inserts
- New running shoes
- Rest, ice, aspirin or NSAIDS

Stress Fractures

Reasons
- Overtraining (insufficient recovery time between workouts)
- Weighting down body when running
- Excessive hill running
- Running in formation
- Running in boots
- Overstriding (short soldiers running with tall soldiers)

Treatment
- Complete rest
- Crutches

Achilles Tendinitis

Reasons
- Overtraining
- Running on hills
- Shoes with low heel height or raised toe height
- Excessive pronation
- Tight hamstrings and/or calf muscles

Treatment
- Stretch hamstrings and calf muscles
- Heel lift
- Moleskin inside back of boots to decrease friction; may need soft-shoes
- Rest, ice, aspirin or NSAIDS

Heel or Foot Pain (Plantar Fasciitis)

Reasons
- Overuse
- Flat foot or high arch
- Toe running
- Running on hills or soft terrain (running on sand)
- Sudden weight increase
- Walking without shoes on hard surfaces

Treatment
- Stretching calf and foot muscles
- Strengthen foot muscles to support the arch–pick up small objects with toes
- Heel pads
- Orthotic shoe inserts
- May need soft-shoes
- Rest, ice, aspirin or NSAIDS

Common Upper Extremity Overuse Injuries

Shoulder Impingement Syndrome (Supraspinatus Tendinitis, Biceps Tendinitis, Shoulder Bursitis)

Reasons
- Overtraining
- Repetitive overhead activities and/or lifting
- Rotator cuff weakness

Treatment
- Activity modification-no lifting above shoulders, no push-ups
- Shoulder stretches and strengthening
- Strengthen rotator cuff muscles
- Rest, ice or heat, aspirin or NSAIDs

Tennis Elbow (Lateral Epicondylitis)

Reasons
- Repetitive wrist extension
- Repetitive gripping/lifting heavy objects
- Not warming-up properly
- Infrequent rest breaks

Treatment
- Wrist and forearm stretches
- Activity modification
- Forearm strap and/or wrist splint
- Rest, ice, aspirin or NSAIDs

Golfer's Elbow (Medial Epicondylitis)

Reasons
- Repetitive wrist flexion
- Repetitive pronation
- Deconditioned muscles
- Not warming-up properly
- Infrequent rest breaks

Treatment
- Wrist and forearm stretches and exercises
- Activity modification
- Forearm strap and/or wrist splint
- Rest, ice, aspirin or NSAIDs

Elbow "Funny Bone" Pain (Ulnar Neuritis/Cubital Tunnel Syndrome)

Reasons
- Excessive pressure on ulnar nerve "funny bone"
- Repetitive flexing of elbow
- Constant bumping of ulnar nerve
- Sleeping with elbows and wrists flexed

Treatment
- Wrist and forearm stretches
- Avoid irritation–elbow pad and forearm activity modifications
- Rest

Wrist Pain (Carpal Tunnel Syndrome)

Reasons
- Repetitive motion (flexing and extending the wrist)
- Excessive push-ups or typing
- Excessive vibration
- Infrequent rest breaks

Treatment
- Wrist stretches
- Wrist splint
- Activity modification
- Rest, ice, aspirin or NSAIDs

Thumb/Wrist Pain (DeQuervains Stenosing Tenosynovitis)

Reasons
- Excessive grasping and pinching activities with thumb
- Infrequent rest breaks
- Tight forearm muscles

Treatment
- Wrist and thumb stretches
- Splint
- Activity modification
- Rest, ice, aspirin or NSAIDs

P.R.I.C.E.

Prevention is the best way to avoid injuries. By following the recommendations and guidelines at the beginning of this booklet, many injuries can be avoided.

For acute injuries:

Rest is essential to prevent further injury and to allow ligaments to heal. This does NOT mean total immobilization, but means avoiding any activity that causes further pain or swelling. Soldiers may be put on crutches to assist the healing process - they must USE THEM. While using the crutches, they should walk naturally and put as much weight on the injured extremity as they can tolerate without excessive pain.

Ice should be used until swelling has resolved. Place an ice pack around the injured joint for twenty minutes every hour. **To make an ice pack**, place ice cubes or crushed ice in a plastic bag, **or** freeze two parts water and one part rubbing alcohol in a baggy, **or** use a bag of frozen vegetables. Wrap the ice pack with a moist towel before applying to the injured area. An **ice massage** may be more effective -freeze water in a paper or styrofoam cup, then rub directly on the injured area for 5 minutes. **Do not** switch to heat unless instructed to do so by a Physical or Occupational Therapist.

Compression is usually in the form of an "ace wrap". Compression should be used until the swelling is gone. Remove the wrap for showering and for placing an ice pack on the injured joint.

Elevation means that the injured joint needs to be positioned above heart level. For example, if the knee or ankle is injured, the soldier should lie on his/her back with the foot propped on pillows. This prevents further swelling and assists in decreasing the swelling that is already present.

***Returning to activities after an injury is individualized; it depends on the extent of the injury and the ability to keep the initial inflammation under control. The Physical or Occupational Therapy staff can assist recovery by instructing in motion, stretching, strengthening, and functional exercises. Without proper rehabilitation, the chances are great that the soldier will sustain another injury.

Heat vs. Ice

Much confusion exists in the choice of heat versus ice treatment as a modality for decreasing pain and/or the symptoms resulting from injury. The following chart may be useful in deciding which to use:

	HEAT Causes:	**COLD/ICE Causes:**
Circulation	Increased blood flow Increased bruising	Decreased blood flow Decreased bruising
Pain	Soothes initially, may have secondary rebound increase after 30 mins.	Initial few minutes of discomfort, then numbness and anesthesia
Muscle Spasm	Mild decrease initially, possible secondary increase after 30 mins.	Marked decrease by direct action on muscle and sensory nerve fibers
Swelling	Increases	Decreases
Metabolism	Increases	Decreases
Depth	Normally shallow, fair with moist heat, deeper with ultrasound	Usually very effective, deeper with ice massage than with ice pack

To summarize:

use **COLD/ICE** when:

1. Injury is acute
2. Muscle spasm is present
3. Swelling is present
4. Pain is sharp, localized

use **HEAT** when:

1. Pain is chronic
2. No swelling is present
3. Pain is dull, aching, and diffuse
4. Sensitive to cold, or when ice is contraindicated

WHEN IN DOUBT, USE ICE

Back Injury Prevention

Back Facts

- 8 out of 10 people have back pain at some time in their life
- 90% recover spontaneously
- Once you have back pain, recurrence is common unless you address the cause(s)

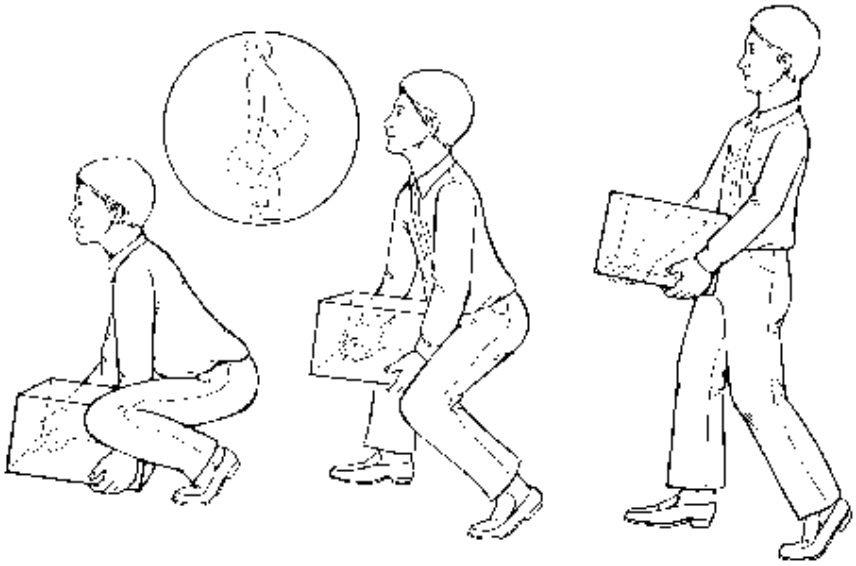
Almost all back disorders are the result of a combination of:

- Poor posture
- Faulty body mechanics
- Stressful living and working habits
- Loss of flexibility
- General decline of physical fitness

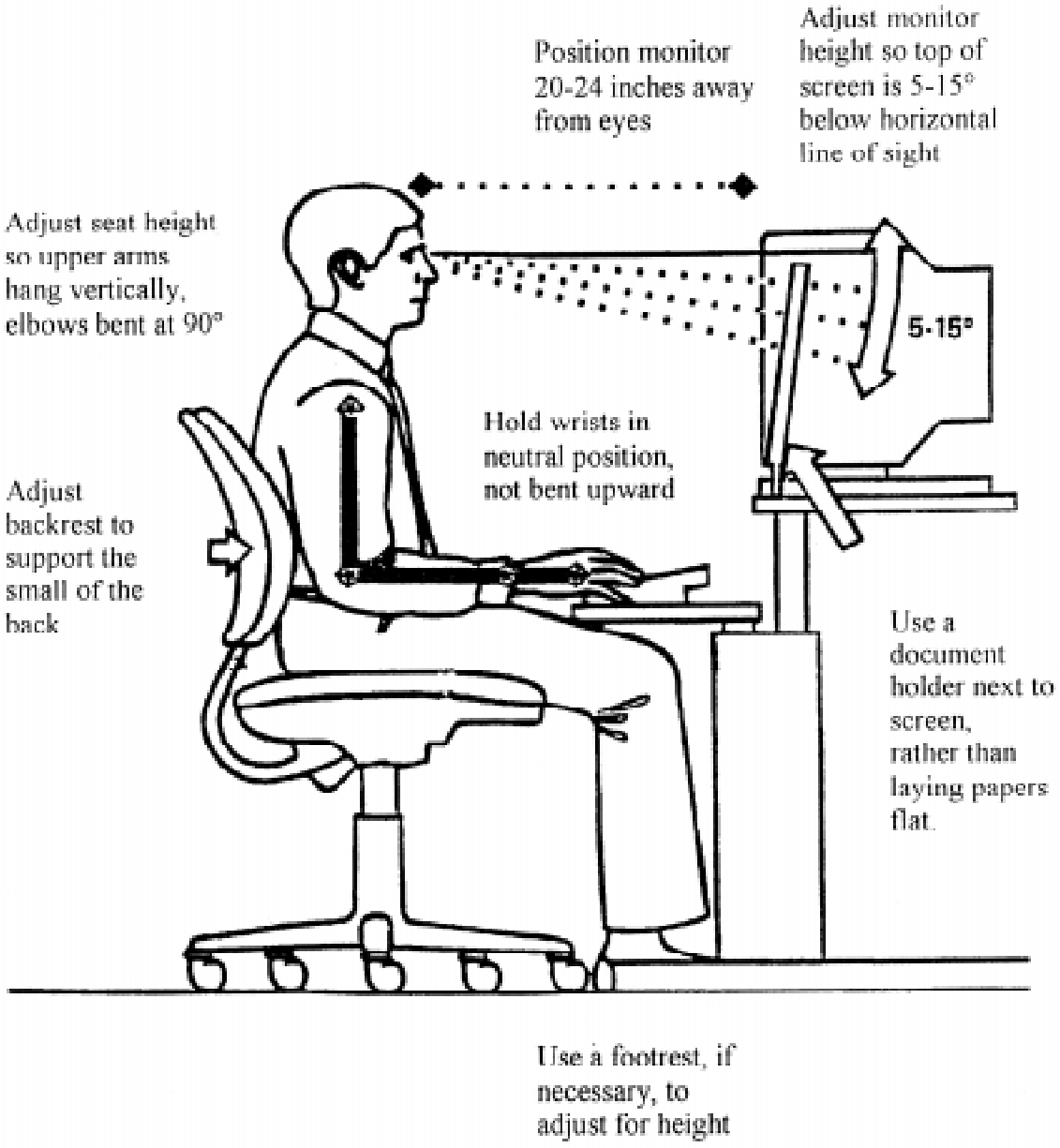
Many injuries can be avoided if you apply some simple techniques:

- Lift properly - to do so, stick your butt out and bend your knees. This will help keep a normal arch in your back and keep you in proper alignment when lifting.
- Keep the item you are lifting close to your body.
- Use your leg and hip muscles instead of your back muscles.
- Don't twist or jerk while lifting.
- If the item is too heavy to lift by yourself—get help.
- Stretch the appropriate muscles in your legs and back.
- Strengthen your abdominal and back muscles.

Proper Lifting Technique:



Computer Ergonomics



Computer Ergonomics

Office Facts

- Over 65% of all occupational injuries are associated with repetitive trauma.
- Repetitive trauma costs an estimated $563 million per year.
- Nearly 75% of all jobs involve computers.

Almost all cumulative trauma injuries are the result of:

- Poor body mechanics
- Improper workstation set-up
- Improper use or position of tools (tool design)
- Poor work/rest cycles

Many problems can be avoided if you apply some simple techniques:

- **ADJUST THE TOOLS, NOT YOUR BODY**

Ensure chairs, keyboards, mouse, monitors, and lighting (room and monitor) are adjusted properly.

- **MOVE**

Change your body position frequently to avoid static postures for long periods of time. For example, if seated at the computer all day, take frequent breaks to stand-up, walk around, and perform simple stretches.

- **RELAX**

Keep your shoulders, arms, and wrists relaxed. Strike keyboards softly.

- **CHANGE**

Alternate your activities and/or hands to accomplish tasks.

- **STRETCH**

For every 20 minutes of continuous work, take 20 seconds to stretch hands, arms, shoulders and back.

Normal: use stability or cushioned shoes

Flat/Low Arch: use stability or motion contol shoes

Rigid/High Arch: use cushioned shoes

For information on running shoes, go to:
www.cs.amedd.army.mil/aegis

For information on the "Right Dose" of running, go to:
www.benning.army.mil/usapfs

Running Shoes

The U.S. Army does not endorse or recommend any specific brand of running shoe, or any specific running publication. The following information is provided to assist the soldier in selecting the most appropriate running shoe for his/her needs. Some of the following information was taken from *Runner's World Magazine*.

All runners (recreational or competitive) should have a basic knowledge of shoe and personal foot anatomy to assist in selecting their running shoes. While the most frequent cause of running injuries is improper training, many problems can be traced to the use of inappropriate shoes, or shoes that are simply worn out.

The first thing you need to know is the best shoe is not always the most expensive shoe. However, keep in mind you need a good pair of shoes to avoid injury, so don't always hunt for the bargain either. All running shoes are different and you need a shoe specifically made for your foot. There are many new models every year with different features, new technology and new marketing strategies. With the information provided here, we hope you will be able to make a smart and well informed selection.

Three Basic Foot Types

1. Neutral: Normal Foot
Normal feet, during running, will hit the ground (heel strike) in supination and then roll into pronation (roll to the inside) as the foot continues to come in contact with the ground (stance phase). Then the foot will supinate (roll to the outside) just prior to the foot leaving the ground (toe off). Eighty percent of runners are heel strikers, the other 20% are mid/forefoot strikers. Look for a stability or cushioned shoe.

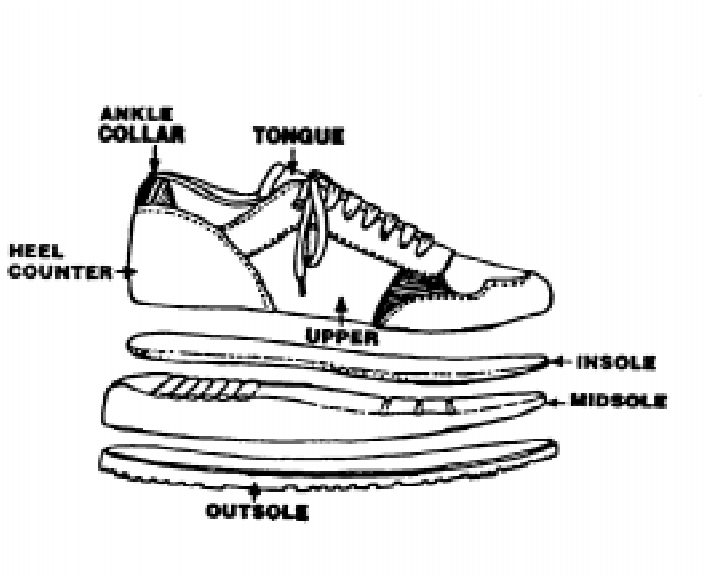
2. Hyperpronation: Flat Foot
Excessive inward tilting. Some may only hyperpronate when running due to the increased force. Hyperpronation is the most common problem and the majority of running shoes are made to fit this type of foot. Look for motion control or stability shoes with firm midsoles. Stay away from cushioned shoes.

3. Hypersupination: High-Arched Foot
Excessive outward tilting. This foot type is less mobile, so more stress/force is translated through the bones, joints, muscles, and tendons. This foot does not adapt to the ground well and will need extra cushioning and flexibility built into the running shoe. Stay away from motion control or stability shoes.

Know Your Foot Type

Check your foot print (step in water then step on a piece of cardboard or any surface that will leave an imprint of your foot). If you are able to see most of your foot then you have a low arch. If you see less of your foot then you have a high arch.

Shoe Anatomy



Midsole: The life of the shoe. It is the padded area between the insole and outsole, now considered the crucial element for protecting runners from relentless pounding. It provides cushioning, comfort, and control during running. Midsoles can be made of EVA (ethylene vinyl acetate) which provides more cushioning, or PU (polyurethane) which is more dense and durable, or both. Alternative materials include air, silicone gels, gases, foams, liquids, or various combinations.

Heel Counter: The material that cups and encircles the heel. It is usually made of a durable, resilient, thermoplastic material. The heel counter's function is to hold the heel in place when the rearfoot makes contact with the ground.

Outsole: The rubber that meets the road. Its primary functions are traction and stability, and, to a lesser extent, cushioning (depending on the material used). Outsoles come in a variety of colors, but the important difference is the composition. A hard carbon rubber is used in the high wear areas of the heel (usually called heel plugs) and blown rubber is used in the midfoot and forefoot where durability is not as critical.

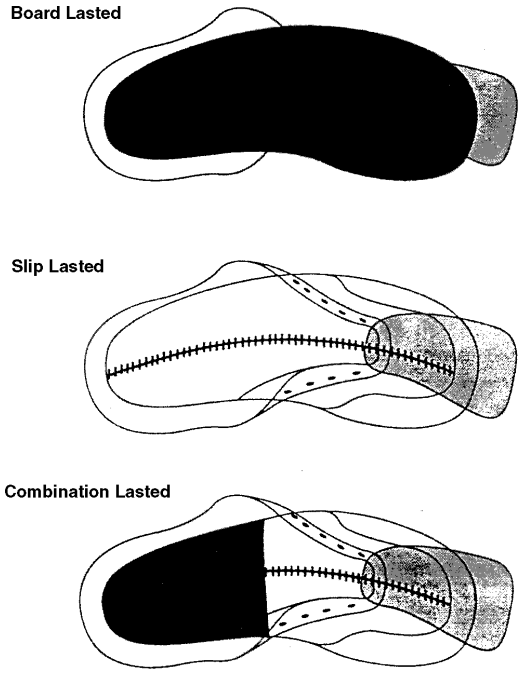
Upper: The leather or nylon that holds the foot in place on the midsole. From a purely technical standpoint, it is not as important in foot function as the midsole. The upper's function is largely one of comfort and cosmetics. This is where all the fancy designs and colors are used.

Ankle Collar: Usually notched and padded for comfort and to reduce rubbing and stress on the Achilles tendon.

Last: The foot-shaped form around which a shoe is constructed. There are three types and three shapes. You can determine which type you have by removing the insole and inspecting the stitching inside the shoe.

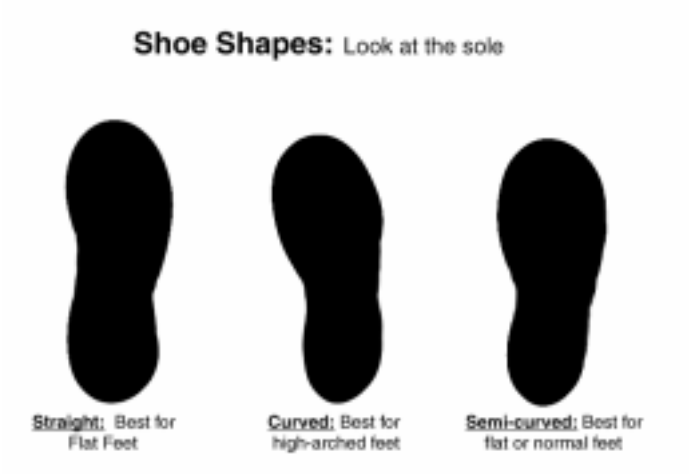
The types are:

Board Lasted–full length piece of fiberboard or cardboard and is the most stable and stiffest. The stitching will be along the outside.
Slip Lasted–stitched together and is the most flexible. The stitching will be down the center.
Combination Lasted–board-lasted in the rearfoot for stability and slip-lasted in the forefoot for flexibility



The shapes are:

Straight–best for flat feet
Curved–best for high-arched feet
Semi-curved–best for flat or normal feet



How to Choose a Running Shoe

Fit: Try on shoes with athletic socks and preferably at the end of the day. The front (toe box) of the shoe should not be tight; you should have the width of a thumbnail between the longest toe and the end of the shoe. The shoe's heel should be snug with no excessive movement. Some shoe companies offer different widths. The shoes should feel comfortable right out of the box - you should not need to break them in.

Cushioning: All shoes should have some form of cushioning, some shoes offer more than others. Those with high-arched feet need more cushioning.

Flexibility: All shoes, no matter what foot type you have must have a flexible forefoot, i.e., flexible at the ball of your foot.

Activity: Running shoes can be used for walking, but walking shoes **should not** be used for running. Court shoes are constructed for a different type of movement and **should not** be substituted for running shoes. They lack the needed shock absorption, are too heavy, and rob the ankle of the freedom of motion it needs. Cross-trainers work well as court shoes, but not running shoes.

Price: Shoes come in all price ranges from $10 to over $100. You should plan on spending at least $65-$85.00. Remember the most expensive shoe is not always the best, but also remember that your body is worth more than a cheap shoe. We recommend going to the local athletic shoe stores to try on a variety of shoes that fit your foot type before deciding on one you like. To save money, you can then check if the PX carries the shoe, or order through a catalog. Running magazines have catalog offers in the back. Stay away from cheap discount store brands or from fake copies while stationed in Korea.

Body Weight: The more you weigh, the more force you will generate. Heavier runners need a shoe that offers more shock absorption and added durability. You may need a motion control shoe.

Shoe Life: On average, running shoes will last 400-600 miles before you need to replace them (if used ONLY for running). Shoes last longer if you run on dirt, trails, or grass. The heavier you are, the sooner you'll need to replace them. If the midsole starts to show through or begins to form horizontal lines . . . you need new shoes. If you notice new aches and pains in your body . . . you may need new shoes. To prolong the life of your shoes, don't wash them in a washing machine, don't dry them in a dryer, don't let them stay wet (air dry them), don't wear them for any activity except running, and don't kick them off by pulling on the heel while they are still tied (this will destroy the heel counter and other stability devices). Clean your shoes with a soft bristle brush (toothbrush) and mild soap and water, then allow them to air dry.

In Summary:

Flat Foot: look for motion control, board last, straight last and PU midsole
High Arch: look for cushioning, slip last, curved last, and EVA midsole
Normal arch: look for stability or cushioning, combination or slip last, semi-curved last and a midsole to fit your running needs
Heavy runner: look for motion control or stability and increased midsole density

One useful reference to find a variety of running shoes for a variety of needs is the *Runner's World Shoe Buyer's Guide* that comes out twice a year.

Manufacturer's Phone Numbers and Web Sits:

ADIDAS	1-800-677-6638	www.adidas.com
AVIA	1-800-848-8698	www.aviashoes.com
ETONIC	1-800-334-0008	www.etonic.com
MIZUNO	1-800-925-4292	www.mizunousa.com
NIKE	1-800-344-6453	www.nike.com
PUMA	1-800-662-7862	www.puma.com
RYKA	1-800-352-3331	www.ryka.com
ASICS	1-800-678-9435	www.asicstiger.com
BROOKS	1-800-227-6657	www.brookssports.com
FILA	1-800-717-5757	www.fila.com
NEW BALANCE	1-800-253-7463	www.newbalance.com
REEBOK	1-800-843-4444	www.reebok.com
SAUCONY	1-800-365-4933	www.saucony.com

Shoes on the web: **www.runnersworld.com** –click on "shoes" link, then click on the name of the company that most interests you. You can save some money by ordering from a shoe warehouse such as **www.holabirdsports.com** or **www.roadrunnersports.com**

Profiles

Soldiers who require rest from specific physical activities will receive a temporary profile. This will enable the soldier to heal properly and accelerate the recovery time. Healing times will vary depending on the extent of the injury/surgery. It is extremely important that the soldier follow the profile as written by his/her healthcare professional.

DD Form 689 will be used to annotate simple restrictions such as "no running for 10 days" or "no push-ups for 2 weeks". DA Form 3349, the Positive Profile, will be used for more specific exercise and activity restrictions. The items marked are activities the soldier can do. If it is not marked, the soldier cannot perform that activity. Soldiers will be encouraged to perform alternate activities to stay physically fit during their recovery.

Common Medical Conditions That Require Prolonged Profiling

ACL Reconstruction (Major Knee Surgery)

Soldiers who have undergone ACL reconstruction will have extensive rehabilitation and prolonged profiling following surgery to obtain optimal results. Inadequate Physical Therapy or excessive stress on the knee may cause failure of the surgical repair leading to prolonged disability and possible discharge from active duty. These soldiers are normally fit to return to full duty in 10-12 months. During the first six months, the soldier will be on a very limiting profile. He/she will also be required to attend Physical Therapy appointments three times a week, for up to four months, followed by less frequent appointments.

Shoulder Repair/Reconstruction

Soldiers who have undergone shoulder surgery will have extensive rehabilitation and profiling for 3-6 months following surgery. Some of the procedures require detaching and reattaching muscles, over-lapping the joint capsule, drilling or cutting the bone, placing screws or staples, and suturing. Therefore, it is extremely important that soldiers follow their profiles to avoid damaging the repair. This includes "no running" due to the jarring effect at the surgical site.

Shin Splints (Stress Reactions/Fractures)

Shin splints is the common term used to describe generalized shin pain with increased activity. It is usually caused by overtraining (too fast, too far, too often), running in boots or old running shoes, running at an "airborne shuffle" pace in formation, or running on concrete everyday. Shin splints resolve with rest, ice, and correction of the cause(s). If this condition is not allowed the proper recovery time (8-10 weeks is common) it can lead to stress reactions or stress fractures in the bone which may require casting, extensive profiling or a medical board.

Acute (recent) Back Injuries

It is in the soldier's best interest to seek medical care right after a back injury. Back injuries usually get better with proper medications, rest and specific exercises. If they are not treated promptly, or if the soldier tries to return to full duty too quickly, the back injury can lead to chronic (long-standing/

Ankle Sprains

Ankle sprains are extremely common in the active duty population and may be prevented if soldiers use high top sneakers while playing basketball and avoid running on uneven terrain or in the dark. The chance of sustaining a recurrent sprain is decreased significantly if the soldier receives prompt medical attention and physical therapy intervention for the initial sprain. Profile lengths will vary– 6-8 weeks is common.

Anterior Knee Pain (PFS/RPPS)

Pain under or around the kneecap is an overuse injury that affects many soldiers. Profiling for the more severe cases includes no running, jumping, squatting, kneeling, marching, or sports for one to two months and then approximately a one-month period of reconditioning (own pace). During this time, however, the soldier may be working on specific exercises recommended by Physical Therapy. This problem can lead to prolonged profiling or medical boarding if not given the proper recovery time.

Wrist Repair/Reconstruction

Soldiers who have undergone wrist surgery will have extensive rehabilitation and profiling for 3-6 months following surgery. Some of the procedures require detaching and reattaching muscles, overlapping the joint capsule, drilling or cutting the bone, placing screws or staples, and suturing. Therefore, it is extremely important that soldiers follow their profiles to avoid damaging the repair. This includes no push-ups, sit-ups, or lifting more than 5 pounds. Soldiers are often given a wrist splint that must be worn at all times.

Wrist Sprains

Wrist sprains are very common with the activities soldiers are required to perform. Excessive push-ups and repetitive activities of the wrist can cause an overuse injury. Frequent stretching, rest, activity modification, and therapy can help alleviate simple sprains. Profiles limiting push-ups and sit-ups for 1-3 months are common.

Average Recovery/Profile Time Frames

The following time frames and limitations are to be used as a general reference only. Recovery times will vary depending on the severity of the injury. Physical limitations will also vary depending on the injury and on the soldier's usual level of activity. Profile time frames do not include time spent on profile prior to initiating Physical or Occupational Therapy.

Neck and Back

Muscle strain
- treatment: 2 - 3 weeks
- profiling: no kevlar, ruck, lifting > 15 lbs, LCE, or flak vest; no sit-ups, leg lifts or flutter kicks; no repeated bending; no running, jumping, or marching; light duty. May need quarters for 24-48 hours.

Ligament sprain
- treatment: 4-6 weeks
- profiling: same as muscle strain

Disc injury (HNP) or nerve root irritation
- treatment: 8 weeks or more
- profiling: same as muscle strain, plus no prolonged postures (sitting, standing); forward bending activities need to be completely avoided

Post-surgical back/neck
- treatment: 3-5 months (as prescribed by surgeon)
- profiling: activity usually limited to walk at own pace and distance for the first month, and then increased gradually

Shoulder

Muscle strain
- treatment: 3-4 weeks
- profiling: no upper body PT or overhead activities; no ruck, LCE, flak vest or weapons firing; no throwing (if on dominant side)

Tendinitis/bursitis
- treatment: 4-8 weeks
- profiling: same as muscle strain

Ligament sprain, muscle tear or shoulder separation
- treatment: 4- 8 weeks
- profiling: same as muscle strain; no lifting with injured arm; no running due to the jarring effect; may need sling 1-3 weeks

Shoulder dislocation
- treatment: 2-4 months
- profiling: same as ligament sprain; may be immobilized for 2-3 weeks, then use a sling for 1-2 more weeks

Elbow

Tendinitis (Tennis Elbow or Golfer's Elbow)
- treatment: 4-6 weeks
- profiling: no use of elbow or wrist on affected side, may need to wear an elbow strap and/or a wrist splint

Wrist

Tendinitis
- treatment: 4-6 weeks
- profiling: no push-ups, sit-ups, or lifting greater than 5-10 lbs, may need to wear wrist splint

Wrist Fracture
- treatment: 2-3 months
- profiling: same as for tendinitis; after profile, gradually increase activities over a 2-4 week period

Knee

Anterior knee pain (RPPS/PFS)
- treatment: 1-2 months
- profiling: no running, jumping, marching, squatting, kneeling or sports

Tendinitis/Bursitis/Iliotibial Band Syndrome
- treatment: 6-8 weeks
- profiling: same as for Anterior knee pain

Ligament sprain/partial tear
- treatment: 6-8 weeks
- profiling: same as for Anterior knee pain

Cartilage (meniscus) damage
- treatment: 2-3 months
- profiling: same as Anterior knee pain

Post-surgical knee (Arthroscopy)
- treatment: 2-3 months
- profiling: activity limited to walk at own pace and distance with crutches for first 2 weeks, then increased gradually

Return to Running Progression

This progression will focus on time for the run instead of distance. For people returning to running after a profile or surgery, this is our recommendation for the progression that you should use to return to running safely. This progression is based on the average person. If it seems too slow or too fast, talk to your therapist before you modify it. You should do this workout every other day. If your unit runs five days a week, you need to find an alternate activity for Tuesday and Thursday.

Criteria to begin walk/jog program: Soldier should be able to walk 3 consecutive miles in 45 minutes.

WEEK 1

Walk for 2 minutes then JOG (not run) for 5 minutes. If you can complete this without significant pain, repeat one more set.

WEEK 2

Walk 2 minutes, jog 5 minutes, repeat 3-4 times (total walk/jog time 21-28 min)

WEEK 3

Walk 2 minutes, run 5 minutes, repeat 4-5 times (total walk/jog time 28-35 min)

WEEK 4

Walk 2 minutes, run 7 minutes, repeat 3-4 times (total walk/jog time 27-36 min)

WEEK 5

Walk 2 minutes, run 7 minutes, repeat 4-5 times (total walk/jog time 36-45 min)

WEEK 6

Walk 1 minute, run 7 minutes, repeat 4-5 times (total walk/jog time 32-40 min)

WEEK 7

Run at least 20 minutes at unit pace/ability group

WEEK 8

Return to unit PT

NOTE: Ensure profiles are at own pace & distance until at least week 7.

Return to Roadmarch Progression

1. If doing PT five days a week, one of those days should include a road-march. At least two road-marches per month are recommended to maintain road-march fitness.

2. Begin road-march training with a load equal to 20% of your body weight.

3. Begin with a distance of 3-5 miles at a 20 minutes per mile pace on flat terrain.

4. Gradually increase the distance and weight each week (i.e. add 1-2 miles per week up to a goal of 12 miles). Increase the ruck weight by 5-7 pounds each week.

5. When gaining a new soldier into the unit or re-gaining a soldier who is coming off an extensive profile it is important to adhere to the above recommendations to avoid injury. These soldiers are particularly susceptible to overuse or recurrent injuries because of lack of conditioning.

Sample Road-March Progression

New, unfit or return from profile soldier:

WEEK	DISTANCE	EQUIPMENT	REMARKS
1-2	2-3 miles	LCE, kevlar, weapon	
3-5	3-5 miles	above gear + 10 lb ruck	Total load about 30 lb
6-8	5-6 miles	above gear + 20 lb ruck	Total load about 40 lb

Physically fit soldier:

1-2	4-6 miles	LCE, kevlar, weapon	
3	4-6 miles	above gear + 10 lb ruck	Total load about 30 lb
4	4-6 miles	above gear + 20-25 lb ruck	Total load about 40 lb
5-7	6-8 miles	same as week 4	same as week 4
8	6-8 miles	above gear + 30lb ruck	Total load about 50 lb
9-10	8-10 miles	same as week 8	same as week 8
10-12	10-12 miles	same as week 8	same as week 8
12-14	10-12 miles	above gear + 35 lb ruck	Total load about 55 lb

Special Populations Physical Training

Soldiers are always susceptible to injury. The following suggestions can help senior learders train soldiers so that they can return to regular unit PT. There are four general rules that you should always follow:

1. Follow professional advice (profiles) from a health care provider.
2. Do not cause further injury.
3. Do not make physical training punitive.
4. Train with your unit when possible.

Soldiers on Profile

Follow the guidelines on the profile:

Aerobic Training

- Use machines (bike, crosstrainer, stairstepper, treadmill) instead of running to limit forces across injured joints
- Maintain intensity to maintain fitness

Strength Training

- Avoid injured area
- Free-weight or multi-joint exercises may be harmful

Flexibility

- Use caution when stretching the injured tissue(s)
- It's best to follow professional guidance

Overweight Soldiers

Aerobic Training

- Work on duration and endurance rather than speed
- Alternate weight-bearing (running, walking) & non weight-bearing (bike, swim) days
- Cross-train
- Do not run twice a day or every day

Strength Training and Flexibility

- Overweight soldiers should not be limited in these areas
- Ensure proper progression

Diet and Exercise

- Education on caloric monitoring
- Teach, coach, mentor
- Consider Nutrition Care referral

Soldiers Who Failed the APFT

Focus on the area failed – Progression is the key
- Do not exceed 5-10% per week increases in distance or repetitions
- Do not run twice a day
- Do not work on daily muscle failure exercises

Include Recovery Days
- Run every other day only – cross train
- Don't exercise same muscle groups every day
- Often violated if additional PT is conducted

Balance
- Work all muscle groups
- Aerobic, strength, and flexibility training
- Include abdominal crunches and back strengthening exercises

New Soldier to the Unit

Progression is the key
- Keep in mind the soldier may have been on leave in addition to in-and out-processing and may not have continued regular physical training
- Gradually increase duration
- Gradually increase the intensity
- Frequency and type of exercise may be the same as the unit, but begin with a slower pace, shorter distances, and less repetitions

Pregnancy PT

Use post-wide Pregnancy PT Programs when available

Basic Principles:
- Always work within the health care provider's guidelines
- Low impact exercises (walk, bike, pool)
- Keep Target Heart Rate (THR) < 140 bpm
- Use strength training machines instead of free weights
- Use caution with flexibility exercises and abdominal training
- Do not regulate the pregnant soldier's diet

Breaking profiles and progressing special population soldiers too aggressively usually results in injuries.

Physical Therapy Clinics

LANDSTUHL REGION

Landstuhl Regional Medical Center	486-7293/8263
Baumholder	485-6357
Wiesbaden	337-7454
SHAPE	423-5866
Vicenza	634-7779/7361

HEIDELBERG REGION

Heidelberg	371-2560/2201
Mannheim	380-4126
Stuttgart	430-8610
Hanau	328-6684

WUERZBURG REGION

Wuerzburg	350-3801
Vilseck	476-3329/3328
Schweinfurt	354-6561

Occupational Therapy Clinics

Landstuhl Regional Medical Center	486-8383/7193
Heidelburg	371-2513
Wuerzburg	350-3881

Health Promotion Coordinators

Headquarters CHPPM Europe	486-7099/8555
Hospital Health Promotion Coordinators Landstuhl Wellness Center	486-8614
Heidelberg Wellness Center	371-2427
Wuerzburg Hospital	350-2202
100th ASG - Grafenwoehr (409th BSB, 282nd BSB)	475-8433
22nd ASG - Vicenza (AST at Livorno)	634-8828
6th ASG - Stuttgart (AST at Garmisch)	430-4073
104th ASG - Hanau 222nd BSB, 414th BSB, 284th BSB, 221st BSB, with ASTs at Buedingen, Friedberg, Babenhausen & Dexheim)	322-9509
Baumholder	485-6784
Bad Kreuznach	490-5871
80th ASG - Chievres, Belgium (254th BSB, AST NATO, Brussels, Schinnen, Netherlands)	423-5979
26th ASG - Heidelberg (411th BSB, 293rd BSB, 233rd BSB, 415th BSB)	373-5139
98th ASG - Wuerzburg (417th BSB, 280th BSB, 235th BSB, 279th BSB, with ASTs at Illesheim and Giebelstadt)	351-4818

Definitions

ACL (Anterior Cruciate Ligament)–one of four major knee ligaments

Anterior - front

Carpal Tunnel Syndrome (CTS)–compression of the median nerve at the wrist, producing numbness and tingling in the fingers

DeQuervains–pain in the tendon at the base of the thumb

Golder's Elbow (Medial Epicondylitis)–pain on the inside of the elbow

Hamstrings (HS)–three muscles on back of the thigh

HNP (Herniated Nucleus Pulposis)–disc injury, commonly occurs in the low back

Iliotibial Band (ITB)–band of connective tissue that runs from hip to knee on outer thigh

Inflammation–Tissue reaction to injury that results in pain, swelling, redness and increased temperature of the area involved. Anti-inflammatory medications (NSAIDs) are used to counter this reaction.

Lateral–outside or outer

Medial–inside or inner

NSAIDs–(Non-Steroidal Anti-Inflammatory Drugs)- Motrin(Ibuprofen), Naprosyn, Indocin, Feldene, Tolectin, Ansaid, Aspirin

Orthotics–shoe inserts (for the purposes of this guide)

Patella–kneecap

Patellofemoral Syndrome (PFS)/Retropatellar Pain Syndrome (RPPS)–Wear and tear of the cartilage behind the kneecap causing anterior knee pain. Symptoms increase with running, going up and down stairs, squatting, kneeling, or prolonged sitting.

Plantar Fasciitis–inflammation of the connective tissue along the bottom of the foot resulting in arch pain and/or heel pain

Posterior–back

Pronate–flat foot position or palm down position

Quadriceps (quads)–four muscles on front of the thigh

Supinate–high arch position or palm up position

Tennis Elbow (Lateral Epicondylitis)–pain on the outside of the elbow

Ulnar Neuritis–compression of ulnar nerve at the "funny bone."

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www.chppmeur.amedd.army.mil