Building the Tactical Athlete

An Injury Prevention and Performance Enhancement Guide
For
Commanders and Leaders

Building the Tactical Athlete

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Contributions

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Physical Training for the Soldier-Athlete

Purpose-driven training

The purpose of the Army Physical Fitness Test (APFT) is to serve as a tool for unit commanders to assess the fitness and battle readiness of their Soldiers. Although this concept is widely known, as it is read aloud prior to each APFT, the APFT is rarely applied as it was designed. Instead, unit commanders commonly use the APFT to guide unit physical fitness training. Excelling at the APFT has therefore largely become the primary purpose of physical training. As a result, instead of focusing on the unit Mission Essential Task List (METL) and battle readiness as the goal of fitness, unit commanders focus on a limited set of skills: push-ups, sit-ups, and distance running when designing their unit physical training. Units generally have 60 to 90 minutes each day allocated for physical training. Focusing on the mission in the design of fitness training is the most effective use of limited time, provides variety of training, decreases the risk for overuse injuries, and ultimately develops better, stronger warriors.

Variety

Soldiers are professional athletes. The profession of soldiering is a physical one. Success as a professional athlete is akin to success as a Soldier in that both professions demand physical prowess. That physical prowess must be task specific. A basketball team trains differently than a football team. Both teams must be essentially physically fit, but their missions are quite different, and their daily training reflects that difference. In the same way, an Infantry unit and a Field Artillery unit both must be comprised of fit Soldiers to be successful, but their training should be mission specific in order to optimize their physical training.

Focusing on the unit METL as the guiding set of skills for a unit's physical training provides much more variety for training than focusing solely on the APFT. Variety increases the breadth of unit readiness while honing skills that pertain to the unit mission. By incorporating variety, commanders can reduce the risk of overuse injuries (sustained in pursuit of an APFT score) that render many of their Soldiers non-deployable. The result: a more highly trained unit with maximum deployability.

Opportunities to excel

Physical training is a daily opportunity to foster unit cohesion and build morale. For Soldiers who excel at distance running, push-ups, and sit-ups, physical training that is geared towards the APFT is an excellent morale builder. These Soldiers are proud of their talent and training and have a daily opportunity to succeed.

Many Soldiers are physically talented and skilled in areas that are unfortunately not tested on the APFT but that are acutely applicable towards the unit mission. Strength, power, speed, and agility are all examples of extremely valuable soldiering skills. Within every unit are Soldiers who may be poor distance runners but who excel at strength or agility driven tasks. These Soldiers are an untapped resource currently flagged as poor physical performers. Physical training, for these Soldiers, is a daily failure.

Unit commanders should know the breadth of their talent pool. Providing emphasis on a variety of physical tasks empowers commanders to know the full physical potential of the unit. It also allows an opportunity for more Soldiers to take pride in their skills. That pride can boost unit and individual morale, inspiring Soldiers to take ownership of their own physical fitness.

Physical fitness training can be an uninspiring, arduous daily task, or it can be a daily opportunity to take pride in the craft of soldiering. How do you want your Soldiers to start their day? As failures? Or as successful, motivated warriors?

Battle Focused Training

A comparison of unit METL and unit PT

Where should our focus be? The following is a breakdown of an example infantry METL tasks and the fitness skill required of each:

Light Infantry Tasks and the Components Required

Task	Muscular Strength	Muscular Endurance	Aerobic Endurance	Anaerobic Endurance	Flexibility	Mobility
Foot March	X	XXX	XXX	X		X
Climb	XXX	XX	X	XXX	XXX	XXX
Sprint to Cover	XX				X	XX
High / Low Crawl	XX	XXX	X	XXX	XX	XXX
Casualty Carry	XXX	XX	X	XXX	XX	XXX
Digging	XX	XXX	XX	XX	X	XX
IMT	XX	XX	X	XXX	XX	XXX
Run		XX	XX	XX	X	X
Total	15	17	11*	17	12	18**

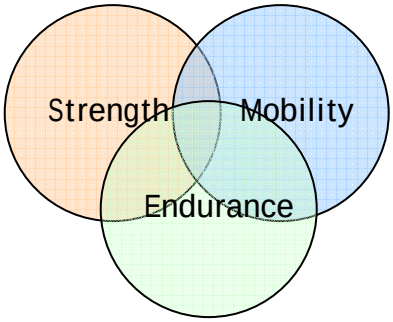
X = Low Demand XX = Moderate Demand XXX = High Demand

**, **Note the above category with the highest METL demand is mobility, and the category with the lowest demand is aerobic endurance.*

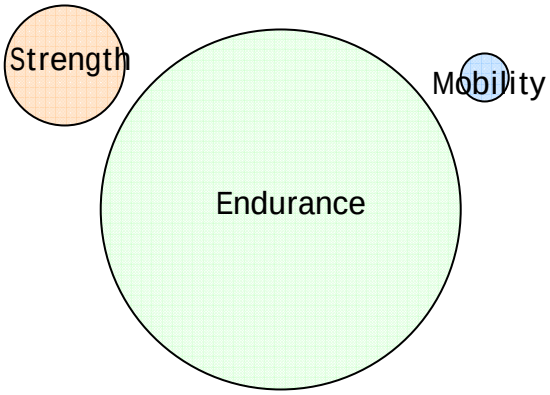
These components can be generalized into strength, endurance, and mobility. Strength and endurance are most familiar in our current PT vocabulary.
Strength is the ability to overcome resistance.
Endurance is the ability to sustain activity.
Mobility includes the following sub-components:

Agility - start/stop, change direction or body position
Balance – control center of gravity or equilibrium
Coordination – perform > 1 task simultaneously
Flexibility/stability - ability to achieve and maintain a position
Speed – movement rate
Power – work output per unit time
Posture – maintain proper body alignment

Overall, in broader terms, we need a balance of endurance, strength, and mobility:



Where is our current focus? APFT training places the majority of the emphasis on endurance training.



Injury rates: what the research tells us

As past activity level increases, the risk for injury decreases. In other words, the worse shape a Soldier is in prior to embarking upon a new fitness regime (for example, a new soldier from basic training), the higher the risk for injury. Below is a chart excerpt from a study involving Army recruits:

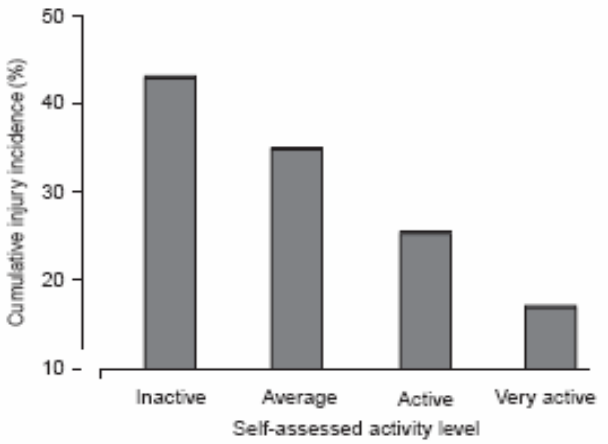


Fig. 6. Relationship between self-assessed past activity level and risk of injury in male US Army trainees. For inactive compared with very active trainees, relative risk = 2.5, p = 0.06 (for trend).[8]

Another study of basic trainees illustrated this concept by showing the faster Soldiers were at lower risk for injury, possibly due to a higher baseline fitness level prior to entering basic training.

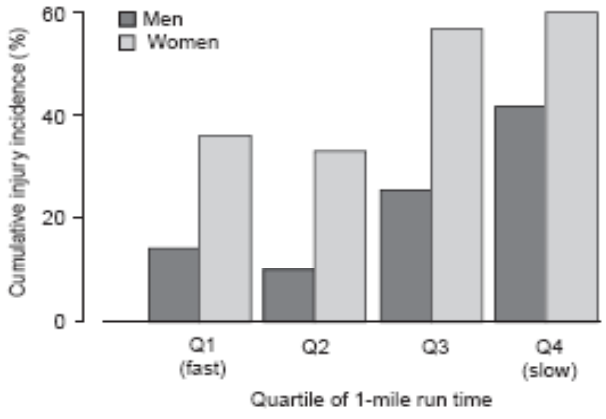
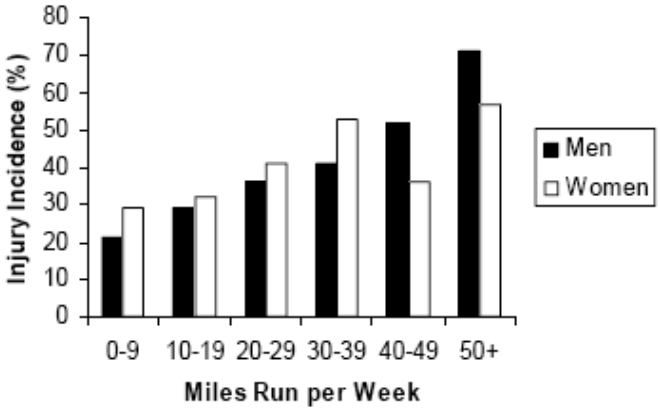


Fig. 4. Relationship between 1.6-kilometre (1-mile) run times and the cumulative incidence of injuries during 8 weeks of basic training among male and female US Army trainees. For men, the relative risk (quartile 2 compared with 4) = 4.2, p < 0.10; for women, the relative risk (quartile 2 compared with 4) = 1.7, p < 0.10; for trends in men and women, p < 0.05.[8]

Conversely, a study of Marine recruits shows a fairly direct relationship between miles run and incidence of injury. The below chart illustrates that as the weekly mileage increases, so does the risk for injury.



If we assume that higher weekly running mileage = faster run times, the above research studies may seem to contradict one another. However, as the table below illustrates, a significantly lower weekly mileage does not result in significantly slower run times, though it does result in significantly lower injuries. The two keys to success are ensuring the miles logged are QUALITY miles and that commanders balance risk for injury with the benefit for each training session, taking into account the variety of fitness levels among their Soldiers.

Table VIII. Total running distance, stress fracture incidence and final 4.8-km (3-mile) run times among 3 groups of male US Marine Corps recruits during a 12-week boot camp[48]

Number in group	Total running distance (km) [miles]	Stress fracture incidence (number/100 recruits)	Final run time (min)
1136	89 (55)	3.7	20.3
1117	66 (41)	2.7	20.7
1097	53 (33)	1.7	20.9

Making your leaders the experts

Who leads PT in your unit? If squad leaders lead PT, *all* squad leaders need to be fitness experts. Share the information in this guide with them. Several pocket guides are also available for distribution and are useful in garrison as well as in a deployed environment. The end of this guide includes a list of resources available for purchase from GSA vendors.

Risk analysis

Before designing a physical fitness program, it is necessary to perform a risk analysis, just as it is necessary when planning any type of training in the Army. It is not possible to prevent all injuries. There is no running mileage, for instance, below which results in zero injuries.[1] Participation in any sport or fitness endeavor results in the risk of overuse or acute injuries.[2] Knowing this, injury control requires implementing a risk-benefit analysis for each exercise or workout. Is the benefit, for example, of having a few excellent long-distance runners in your unit worth the risk of overuse injuries?

[1] Birrer Richard B. Sports Medicine for the Primary Care Physician. 2nd ed. New York: CRC-Press; 1994.
[2] Roald Bahr, Sverre Maehlum. Clinical Guide to Sports Injuries; 2004.

The Basics of Fitness

PROVERBS

The principles of fitness provide an outline of basics necessary to make any exercise program successful. The following guide to terms includes a practical approach to the principles that are often memorized and quoted, but seldom applied appropriately.

Progression: To avoid injuries, the intensity and/or duration of any exercise program should increase gradually.

- Progression should be at a rate of no more than 10% per week.
- It is best to first increase the intensity, then the duration, in a stepwise fashion.

Regularity: An effective physical training program needs to be carried out on a regular basis.

- The American College of Sports Medicine (ACSM) recommends a cumulative of 20-60 minutes of moderate aerobic activity 3-5 times per week and resistance training 2-3 times per week.[3]
    - Training calendars and weather may not always allow for physical training to be carried out first thing in the morning. Afternoon physical training may be optimal at times.
    - Adjust your schedule as necessary; in order to allow a platoon or company to weight train at the gym, you may consider an off cycle training hour during the afternoon a couple of times per week.

Overload: For a desired training effect, it is necessary to exceed the normal demands on the body during a workout. This is not to be confused with the term "muscle failure."

- At "muscle failure," the muscles that are needed to perform an exercise properly have been exhausted. After form begins to fail, the body must rely on non-contractile structures for stability to complete the exercise. Those structures include ligaments, capsules, and cartilage. When over-stressed or torn, these structures require surgical repair and months of rehabilitation.
    - To balance an effective level of physical demand on the body without reaching muscle failure, it is optimal to continue an exercise such as push-ups until perfect form can no longer be maintained.

[3] Jeffrey L Roitman EdD, FACSM, ed. ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription. Fourth ed. Baltimore, Maryland: American College of Sports Medicine; 2001.

    - At that point it is necessary to continue the exercise in a modified form, such as on your knees, or discontinue the set and start the next set after a rest period.
- For basic resistance training, select the weight that can be lifted 8-12 times before it is difficult to lift properly for an additional repetition.
    - If it is easy to lift the weight 12 times and you can finish a set without difficulty, more weight is necessary.
    - If you are unable to lift the weight for a full 8 repetitions without sacrificing form, the weight is too heavy.

Variety: Adding variety to an exercise program is a great way to avoid injuries while continuing challenging training. Performing the same type of exercise every day will result in overuse injuries. Variety can be applied by varying the general type of exercise to include muscular strength, muscular endurance, aerobic endurance, anaerobic endurance, flexibility, and mobility.

- Variety can also be applied within each of these categories.
    - Aerobic and anaerobic endurance training can include a ruck march, a distance run, long shallow hill repetitions, short steep hill repetitions, fartlek training, trail running, swimming, or cycling.
    - Mobility training can include sprints on the track, stadium stairs, ladder training, cone drills, running through an urban training site in full kit, or sports day.
    - Muscular strength and endurance can include abdominal and back strengthening without equipment, training with the swiss ball, dumbbell training, kettle ball or medicine ball training, sandbag training, or an obstacle course.

Recovery: Recovery is absolutely essential to minimize overuse injuries. There are two main ways to recover following a hard workout:

- One option is to follow a hard workout with an easy workout of the same type of exercise.
- The other option is to exercise with either a different body region or a different type of exercise the following day (i.e. speed and agility followed by endurance training, then core strengthening). This option incorporates the element of variety.

Balance: In a broad sense, it is necessary to balance all of the principles of fitness to avoid overstressing one, which will result in injury or suboptimal training.

Specificity: Always keep the goal of physical training in mind when designing an exercise program. Soldiers are professional athletes, and their sport is combat. To improve at combat skills, elements of these skills should be incorporated into every physical training session, and this guide will show you how to do that.

FITT Principle

Each exercise program should be considered and designes using the FITT principle. FITT stands for frequency, intensity, time, and type. When progressing an exercise program, only ONE of these factors can be progressed at a time.

Frequency: As above, the American College of Sports Medicine (ACSM) recommends 20-60 minutes of cardiovascular training at least 3-5 times per week plus resistance training 2-3 times per week.[4]

Intensity: There are many different ways to measure the intensity of training. Many of these methods, including heart rate reserve (HRR), are difficult to apply practically. The optimal intensity of training will vary among individuals, and choosing an appropriate intensity for a group of individuals is often just as much an art as it is a science.

- Using ability groups for cardiovascular training is one method of optimizing the intensity of training for a group.
- It is also advisable to consistently use the same leader, such as a team leader or squad leader, for daily PT to adjust the intensity of the daily workout appropriately in the context of the weekly PT program.

Time: The time, or duration, of a cardiovascular workout should be at least 20-30 minutes of continuous, rhythmic exercise of large muscle groups.

- "Time" for a strength-training workout is best quantified in repetitions and sets. The ACSM recommends 3 sets of 8-12 repetitions of strength training exercises, two to three times weekly.
- Another option is to perform as many repetitions as possible (without sacrificing form) during 3 30-60 second intervals. This method is further covered under "Blitz training" or "The Sixties" in the idea book that follows.

Type: The type of training, broken into large categories, includes muscular strength, muscular endurance, aerobic endurance, anaerobic endurance, flexibility, and mobility. The type of training should vary daily throughout a training week.

[4] Jeffrey L Roitman EdD, FACSM, ed. ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription. Fourth ed. Baltimore, Maryland: American College of Sports Medicine; 2001.

Intensity of Training

Heart-rate training

Many athletes find heart-rate training beneficial to ensure proper intensity. The ACSM recommends an intensity of 65%-90% maximum heart rate (HR_{max}) during aerobic exercise.

The simple formula for calculating HR_{max} is 220-age. Target training heart rate is 65%-90% of that number. The max heart rate, for example, for a 30 year-old male should be 190 beats per minute. Target training heart rate should be between 123.5 and 171 beats per minute.

To take the general fitness of an individual into account (certainly all individuals of a particular age do not have the same training heart rate!) a more precise way to calculate training heart rate is to calculate a training heart rate reserve (HRR). The HRR takes into account the individuals resting heart rate (RHR), which is lower for physically fit individuals. The ACSM recommends an intensity of 50% to 85% of HRR for aerobic exercise. ("Intense exercise" typically used for high performance or athletic training is 75% HRR or higher.)

To calculate target training heart rate using HRR, use the following formula:

- RHR + [(HR_{max} – RHR) x 50% to 85%]

Let's compare two 30 year olds.

- A sedentary 30 year old may have a resting heart rate, for example, of 90 beats per minute.
    - His training heart rate would therefore be:
    - 90 + [(190-90) x 50% to 85%]
    - =140 to 175 beats per minute
- A fit 30 year old may have a resting heart rate of, for example, 50 beats per minute.
    - His training heart rate would be:
    - 50 + [(190-50) x 50% to 85%]
    - =120 to 169 beats per minute

To apply heart rate training to your company, a practical way to determine training heart rate would be to take resting heart rates monthly or quarterly by having Soldiers take their resting radial pulse (at the wrist) for 10 seconds and write down the number on an index card with their name. Input the data into a spreadsheet that calculates the training heart rate with the above formula (make sure to multiply the number by 6 to get the beats per minute!), then hand each Soldier back their card with their personal training heart rate.

Rate of Perceived Exertion scale (RPE)

A simpler way to determine intensity is to use the Borg RPE scale. This scale is numbered from 6 (no exertion) to 20 (max exertion) and is a way to communicate the intended intensity of training for a particular exercise session. If your Soldiers understand this scale, the intensity of their exercise can match your intent.

Borg Rate of Perceived Exertion Scale	
6	No exertion at all
7	7.5 = Extremely light
8	
9	Very light
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard (heavy)
16	
17	Very hard
18	
19	Extremely hard
20	Maximal exertion

9 corresponds to "very light" exercise. For a healthy person, it is like walking slowly at his or her own pace for some minutes

13 on the scale is "somewhat hard" exercise, but it still feels OK to continue.

17 "very hard" is very strenuous. A healthy person can still go on, but he or she really has to push him- or herself. It feels very heavy, and the person is very tired.

19 on the scale is an extremely strenuous exercise level. For most people this is the most strenuous exercise they have ever experienced.

Training in the target training heart rate would primarily be between 14 and 16 on the Borg RPE scale.

Anaerobic vs. Aerobic Training

Aerobic training occurs when oxygen is readily available for the body to use in the breakdown of energy sources for fuel. When the muscles are using oxygen faster than we can re-supply the oxygen during breathing, we switch to a different method of energy breakdown, and lactic acid (also known as lactate) becomes a byproduct. This type of exercise is anaerobic training (so "anaerobic" is somewhat of a misnomer – oxygen is being used, but too quickly for our breathing to keep up). Distance running is an example of aerobic training. Sprinting is an example of anaerobic training.

Lactate threshold

Lactic acid in the system is painful. Thankfully, once our breathing becomes more regular and our supply of oxygen is once again greater than our use of oxygen, the lactic acid clears from our system. This typically takes about two to five minutes once we finish a bout of anaerobic exercise. The intensity of exercise at which our oxygen consumption can no longer keep up with our use of oxygen is the "anaerobic threshold." This threshold is directly related to the "lactate threshold," or the point at which lactic acid begins to build up in the blood. When we first begin to produce lactic acid during exercise, our blood can chemically buffer, or neutralize, the lactic acid (the more highly trained the athlete, the more lactic acid can be neutralized, to a point). After the lactate threshold, there is too much lactic acid to neutralize, so it begins to build up.[5]

Many of our tasks as professional military athletes require a combination of aerobic and anaerobic tasks. Our current PT programs focus primarily on aerobic training. Some of our most important tasks (including sprinting into a building or sprinting to find cover or lifting a heavy piece of equipment) require anaerobic prowess. For optimal performance at anaerobic tasks, we MUST train at or above the lactate threshold at least 2-3 times per week. On the PRE scale, that is training between 14 and 18. This is especially important if upon completing the anaerobic tasks, we must control our breathing well enough to accurately fire a weapon.

In order to improve the ability to perform repeated bouts of short sprints or bursts of anaerobic activity that Soldiers often perform during combat, recent research has shown that we must include training sessions that involve short (<40 second) bursts of anaerobic exercise with short recovery intervals (<30 seconds) between bursts that do not allow full lactic acid clearance before the next burst of activity.[6]

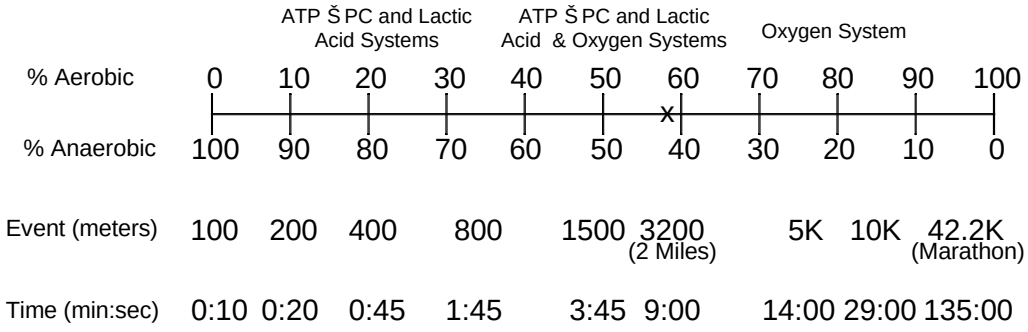
[5] Berne Robert M, Levy Matthew N. Principles of Physiology. 3rd ed. St. Louis: Mosby, Inc; 2000.
[6] Edge J, Bishop D, Goodman C, Dawson B. Effects of high- and moderate-intensity training on metabolism and repeated sprints. Medicine & Science in Sports & Exercise. Nov 2005;37(11):1975-1982.

VO_{2max}

Another term related to anaerobic and aerobic training is the "VO_{2max}." This is the maximum rate that oxygen can be breathed in, transported by the blood, then used by the muscles.[7] We can think of VO_{2max} as our fuel efficiency. In normal people, the lactate threshold occurs at about 40-60% of VO_{2max}. In trained athletes, the lactate threshold occurs at about 70-90% of VO_{2max}. So in other words, untrained individuals can't even get to the point that they maximize their fuel efficiency because of the discomfort from built up lactic acid in their blood. We can train our Soldiers to increase both the VO_{2max} and the lactate threshold. We can train them to have better fuel efficiency overall, and we can train them to perform closer to that maximum efficiency. To do so, we must include anaerobic training (interval training, speed and agility drills, and resistance training) in addition to aerobic training.

It is also important to include aerobic training to maintain endurance. As a general rule of thumb, an activity of longer duration should be carried out at a lower intensity. Endurance training is important for improving and maintaining our fuel efficiency, or VO_{2max}. For optimal performance, it is imperative to increase BOTH the VO_{2max} and the lactate threshold. This can be achieved by performing regular aerobic exercise and incorporating anaerobic training at or above the lactate threshold. To improve the ability to perform repeated bouts of sprints, some of the anaerobic training must be carried out in a way that does not allow for lactic acid clearance before the next bout of activity.

The table below illustrates the relationship between energy source and duration of activity.



The approximate percentage of contribution of aerobic and anaerobic energy sources in selected track events

[7] Berne Robert M, Levy Matthew N. Principles of Physiology. 3rd ed. St. Louis: Mosby, Inc; 2000.

Myth-busters

Stretching

1. Myth: It is best to stretch before exercise- it helps you loosen up before you begin working out.

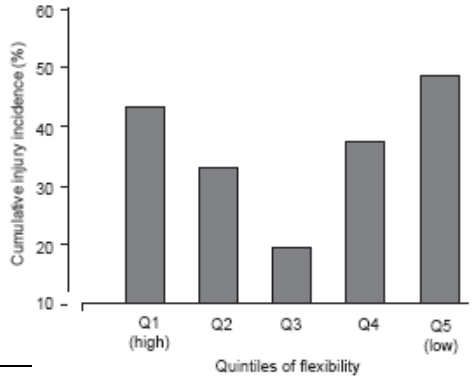
Fact: It is best to stretch dynamically before exercising and statically after exercising. A dynamic stretching session includes the warm-up. See the Idea Book under "Dynamic Stretching" for examples. Dynamic stretching can enhance power when performed before exercise.[8] Stretching muscles statically (holding the stretch for more than 15 seconds) *before* exercise can actually decrease performance during power and agility activities. Static stretching should be performed only *after* exercise.[9] When performed after exercise, static stretching can help to decrease the risk for muscular injuries.[10]

2. Myth: You should hold your stretch for 10 seconds every time you stretch.

Fact: The latest research shows that stretching between 15 and 30 seconds provides optimal muscle lengthening. Stretching longer than 30 seconds and more than once per day provides no additional benefit to healthy (non-injured) individuals.[11]

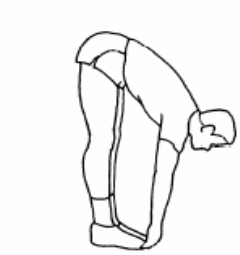
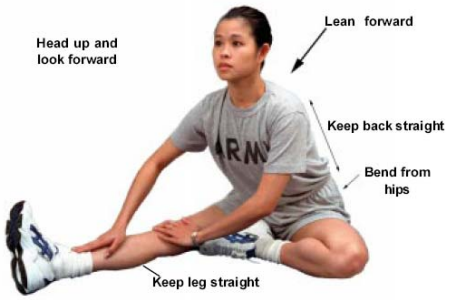
3. Myth: Everyone should stretch to prevent injuries.

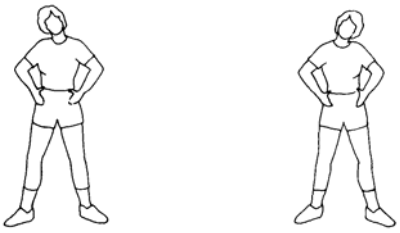
Fact: Only people who are less flexible than average and people of average flexibility need to stretch. People of the more flexible two quintiles of the population are actually at greater risk for injury if they include stretching in their exercise routine. The following chart from a study including basic trainees illustrates this principle.[12]

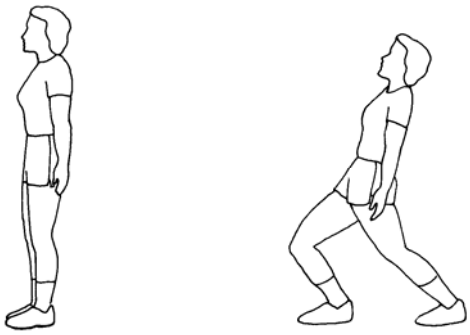


[8] Yamaguchi T, Ishii K. Effects of static stretching for 30 seconds and dynamic stretching on leg extension power. Journal of Strength & Conditioning Research. Aug 2005;19(3):677-683.
[9] McMillian DJ, MOore JH, Halter BS, Taylor DC. Dynamic vs statis-stretching warm up: the effect on power and agility performance. Strength & Conditioning Research. Aug 2006;20(3):492-499.
[10] Amako M, Oda T, Masuoka MK, Yokoi H, Campisi P. Effect of static stretching on prevention of injuries for military recruits. Military Medicine. Jun 2003;168(6):442-446.
[11] Roberts JM, Wilson K. Effect of stretching duration on active and passive range of motion in the lower extremity. British Journal of Sports Medicine. Aug 1999;33(4):259-263.
[12] Jones BH, Cowan DN, Knapik JJ. Exercise, training and injuries. Sports Med. Sep 1994;18(3):202-214.

4. Do's and don'ts: Common stretching mistakes

Don't:	Do:
Hamstring stretch: ▪ *Don't* bend your back forward to reach for your toes. 	Hamstring stretch: Dynamic (before) ▪ *Do* straighten out your leg for 3-5 seconds, tightening your thigh muscle each time. Repeat 10 times.  Hamstring stretch: Static (after) ▪ *Do* a static stretch of the above exercise (hold 30 seconds). OR *do* keep your back straight and bend at the hips only (below). 

Don't:	Do:
Thigh stretch: ▪ Don't use the **opposite** hand/ **opposite** leg to pull. ▪ Don't bring your knee out to the side. 	Thigh stretch: Dynamic (before) ▪ Do hold for 3-5 seconds, 10 repetitions. Also stretches calf muscles.  Thigh stretch: Static (after) ▪ **Same** arm, **same** leg. Bring knees together. Pull one knee behind the other. 
Neck rotation: ▪ Don't rotate your neck as a warm up- it causes damage to the discs in your neck. 	Neck rotation: Dynamic (before) ▪ Do move north, south, east, and west in a 4 count motion, (forward, backward, and sidebend each direction)  

Calf stretch: ▪ Don't stretch one leg at a time. 	Calf stretch: Static (after) ▪ Do stretch both legs at once. 

Fitness maintenance

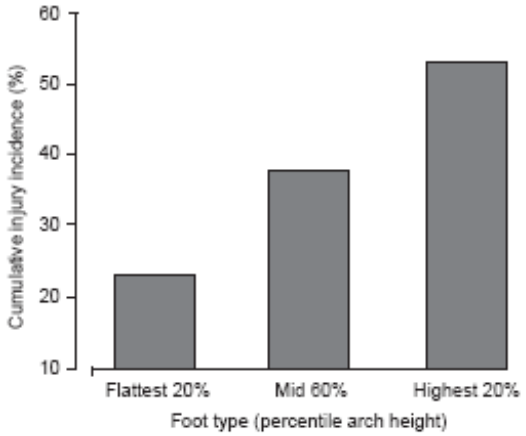
1. Myth: When on a deployment or on an extended field problem, since we can't exercise very often or for as long, it's best just to forego exercise altogether and pick up where we left off when we return home.

Fact: For up to 90 days, you can maintain your performance level if you exercise 1/3 as often for 1/3 as long (one-third of your normal duration and frequency) as long as you maintain the same level of INTENSITY. If you must limit your exercise program for 3 months, it is best to exercise whenever you can, even if it is only 1 or 2 times per week, for at least 15-20 minutes. The key is to maintain your level of intensity.

Foot type

1. Myth: Flat footed individuals are at higher risk for injury.

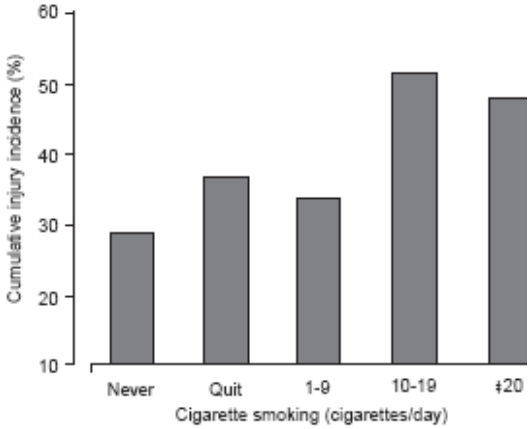
Fact: Flat footed individuals are actually at the lowest risk for injury – even lower than those with normal arches![13]



Smoking and tobacco

1. Myth: Smoking and tobacco use have no effect on rate of injury.

Fact: Smoking and tobacco use increase the risk for injury. They also prolong the time it takes to heal from an injury because nicotine prevents oxygen from getting to the injured muscles, soft tissues, and bones. Instead, carbon monoxide reaches these structures and does not aid in the healing process.[14]



[13] Jones BH, Cowan DN, Knapik JJ. Exercise, training and injuries. Sports Med. Sep 1994;18(3):202-214.
[14] Ibid.

Weight loss

1. Myth: Running 1 mile = walking 1 mile in terms of calories.

Fact: Running 1 mile burns more calories than walking 1 mile due to upward propulsion (time when both feet are off the ground) and heat production. Also, don't forget that to calculate calories burned with exercise when attempting to create a caloric deficit (more output than input), you must consider base metabolic rate.

- Take, for example walking 4 miles vs. running 4 miles. Assume for a minute that walking and running do burn the same amount of calories (for simplicity sake), 100 calories per mile.
- Base metabolic rate for our example is 80 calories per hour, or how many calories you burn per hour just at rest.
- If you walk 4 miles and burn 400 calories, it has taken 1 hour. You must subtract the amount of calories you would have burned anyway at rest, which is 80 calories. Your caloric deficit is 320 calories.
- If you run 4 miles and burn 400 calories, it has taken 30 minutes. Your base metabolic calories are only 40, so your deficit is 360 calories.

Adding in the difference in caloric output due to heat and upward propulsion magnifies this difference.

2. Myth: Exercising for a longer time at a slower pace is better for weight loss because you're using a fat-burning pace.

Fact: When exercising at a lower intensity, *proportionally* more of the calories burned are fat calories. Since, however, at lower intensities, fewer calories are burned overall, a smaller *total* amount of fat is burned than with exercising at a higher intensity. Also, with higher intensity exercise, your metabolic rate remains more elevated throughout the day.

For example, if you walk 20 minutes (~100 calories) and burn 65% fat, that's 65 fat calories. If you run 20 minutes (~250 calories) and burn 40% fat, that's 100 fat calories!

Also, please note that the simple equation for weight loss is calories burned > calories consumed, regardless of the source (fat, carbohydrate, or protein).

Idea Book

Below is an example 6 week menu for unit physical training that follows the principles addressed in this guide. The 6 week plan outlined below can be used over again every 6 weeks by choosing different options for each type of exercise. Each plan will be different from unit to unit based upon the METL of the users. Choices for each type of exercise are outlined in the tabbed sections that follow this menu.

6-Week Plan	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Dynamic warm-up Push strength Speed and agility	Dynamic warm-up Core strength Ability group run/Non-impact	Dynamic warm-up Pull strength High intensity run	Dynamic warm-up Core strength Non-impact	Footmarch
Week 2	Dynamic warm-up Pull strength High intensity run	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Push strength Speed and agility	Dynamic warm-up Core strength Ability group run/Non-impact	Footmarch
Week 3	Dynamic warm-up Core strength Push strength	Dynamic warm-up Pull strength High intensity run	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Core strength Ability group run/Non-impact	Dynamic warm up Push strength High intensity run
Week 4	Dynamic warm-up Pull strength High intensity run	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Push strength Speed and agility	Dynamic warm-up Core strength Ability group run/Non-impact	Footmarch
Week 5	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Push strength High intensity run	Dynamic warm-up Core strength Pull strength	Dynamic warm-up Core strength Ability group run/Non-impact	Dynamic warm up Push strength High intensity run
Week 6	Dynamic warm-up Core strength Push strength	Dynamic warm-up Core strength Ability group run/Non-impact	Dynamic warm-up Pull strength High intensity run	Dynamic warm-up Core strength Non-impact	Dynamic warm up Push strength High intensity run

KEY
Warm-up/ Flexibility
Strength
Aerobic
Anaerobic

Examples of Choices

Speed and agility	High intensity run	Ability group run	Non-impact day (non run/march)
Combination of:	Choose One:	*20-45 minute duration*	Choose One:
Ladder drills	30/30	Choose One:	Swim
Cutting drills	Track intervals	Recovery	Bike
Short sprints	Short hills	Trail run (not in the dark)	Combatives
Plyometrics	Long hills		Grass drills
Medicine ball drills	Fartlek		
Kettle ball	Tempo		

Push strength	Pull strength	Core strength	Footmarch
Choose 2 upper & 2 lower:	Choose 2 upper & 2 lower:	Combination of:	Add no > than 1/2 mile per march
Bench press	Pull ups	Plank (any variations)	15-20 min per mile
Push ups	Sit ups (follow with cobra)	Star push up	Up to 55 lbs
Overhead press	Lat pull down	Crunches	Wear boots
Tricep extensions	Seated row	Reverse pike	
Leg press	Hamstring curls	Back extension	
Squats	Cleans	Warrior pose	
Lunges	Curls	Pike push up	
		Swimmer kicks	
		V-ups	
		New 8 count push up	

Dynamic Warm Up

A dynamic warm up combines the warm up and the stretching, providing the optimal pre-exercise type of stretching while maximizing time for your physical training session. Do each of the following exercises listed below as a dynamic warm up, or choose 4 upper body and 4 lower body exercises.

1. Neck Bender

1. Bend your neck forward, dropping your chin toward your chest.

2. Return to start position.

3. Look upward, bending your neck back towards your spine.

4. Return to start position.

2. Neck Side Bender

1. Bend your neck to your left, moving your left ear toward your left shoulder.

2. Return to start position.

3. Repeat movement #1 to right side.

4. Return to start position.

3. Front shoulder roll

1. Move your left arm to the rear and upward, rotating your left shoulder 360°.

2. Return to start position.

3. Repeat movement #1 to right arm/ shoulder.

4. Return to start position.

4. Rear shoulder roll

1. Move your left arm forward and upward, rotating your left shoulder 360°.

2. Return to start position.

3. Repeat movement #1 to right arm/ shoulder.

4. Return to start position.

5. Turn and reach

1. Rotate your upper torso to the left as far as possible while head and hips remain facing frontward.

2. Return to start position.

3. Repeat movement #1 to the right.

4. Return to start position.

6. Trunk bender

1. Bend your trunk rearward at the hips to 45° and look upward.

2. Return to start position.

3. Bend your trunk forward at the hips to 90° and maintain a straight spine with your eyes forward.

4. Return to start position.

7. Body arch

1. Keeping your knees and elbows straight, raise your hips upward and move your heels toward the ground.

2. Return to start position.

3. Keeping your knees and elbow straight, lower your hips toward the ground.

4. Return to start position.

8. Side lunge and reach

1. Lunge sideward to the left, while facing forward and reach overhead with your right arm forming a straight line from your fingertips to your right foot.

2. Return to start position.

3. Repeat movement #1 to the right.

4. Return to start position.

9. Rear lunge and reach

1. Lunge rearward with your left foot while raising both arms overhead, palms inward. Lower body slightly forward.

2. Return to start position.

3. Repeat movement #1 to the right.

4. Return to start position.

Movement Drills

1. Diagonal squat and reach

1. Step rearward with your left foot while rotating left and executing a squat. Keeping your elbows extended, lower your arms and place them outside of you left knee.

2. Return to start position.

3. Repeat movement #1 to the right.

4. Return to start position.

2. Squat thrust

1. Assume squat position placing your hands on the ground, shoulder width apart.

2. Thrust your legs backward into the front leaning rest position with your feet together.

3. Repeat movement #1.

4. Return to start position.

3. Push up

1. Bend your elbows and touch your chest to the ground while keeping your body straight.

2. Return to start position.

3. Repeat movement #1.

4. Return to start position.

4. Reverse squat and reach

1. Step rearward with your left foot while rotating right and executing a squat. Keeping your elbows extended, lower your arms and place them outside of your right knee.

2. Return to start position.

3. Repeat movement #1 to the right.

4. Return to start position.

5. Squat thrust straddle

COUNT 1: Assume squat position
COUNT 2: Assume front leaning rest by thrusting legs backwards full body length
COUNT 3: Jump feet slightly and separate legs so a 45-degree angle is formed, keeping body straight from head to feet
COUNT 4: Jump slightly and return to position of count 2
COUNT 5: Repeat count 3
COUNT 6: Repeat count 4
COUNT 7: Return to squat position
COUNT 8: Return to start position, keeping back straight and sound off with appropriate number of repetitions in sequence

Strength Training (Push/Pull)

To start a strength training program, choose 2 "push" and 2 "pull" exercises for the upper body and lower body, each. Add at least one abdominal and one back exercise (see core and balance section, p. 49). As you improve, add more "push" and "pull" exercises, but always balance "push" with "pull." Historically, we have focused more on "push" exercises in the Army, which results in very strong chest and abdominal muscles and relatively weak back muscles. This can lead to injury as well as pain and fatigue when wearing body armor.

- **See Appendix A for proper weight lifting technique.**

Here are just a few examples of "push" and "pull" exercises:

Upper Body		Lower Body	
Push	**Pull**	**Push**	**Pull**
Push ups	Pull ups	Squat or lunge	Hamstring curl
Bench Press	Upright row	Heel raises	Toe raises
Dips	Flys	Hip abduction	Hip adduction

Here are some ways to incorporate "push" and "pull" into your PT program:

PUSH						
Week	**Push**	**Rest**	**Push**	**Rest**	**Push**	**Rest**
1	2:00	:30	1:00	:30	:30	:30
2	2:00	:30	1:00	:30	:30	:30
3	2:20	:30	1:10	:30	:40	:30
4	2:20	:30	1:10	:30	:40	:30
5	2:40	:30	1:20	:30	:50	:30
6	2:40	:30	1:20	:30	:50	:30
7	3:00	:30	1:30	:30	1:00	:30
8	3:00	:30	1:30	:30	1:00	:30
9	3:20	:30	1:40	:30	1:10	:30
10	3:20	:30	1:40	:30	1:10	:30
11	3:40	:30	1:50	:30	1:20	:30
12	**APFT**					

Notes:
1. **Pyramids:**
   -Wks 1 and 4:
   1 to 10 pyramid of dips
   -Wks 5 and 11:
   15 to 20 pyramid of dips

PULL			
Week	**Chinups**	**Inclinie Bar**	**Rope**
1	6-5-4-3-2-1 = 21	Muscle Fatigue	1
2	6-5-4-3-2-1 = 21	Muscle Fatigue	1
3	7-6-5-4-3 = 25	Muscle Fatigue	1
4	7-6-5-4-3 = 25	Muscle Fatigue	1
5	8-7-5-4-3 = 27	Muscle Fatigue	2
6	8-7-5-4-3 = 27	Muscle Fatigue	2
7	9-8-6-4-2 = 29	Muscle Fatigue	2
8	9-8-6-4-2 = 29	Muscle Fatigue	2
9	10-8-6-4-2 = 30	Muscle Fatigue	3
10	10-8-6-4-2 = 30	Muscle Fatigue	3
11	10-8-6-4-2 = 30	Muscle Fatigue	3
12	**APFT**		

Notes:
1. **Chin-ups:** do negatives if unable to meet the standard.
2. **Muscle fatigue:** once you can no longer maintain perfect form, you have reached muscle fatigue. Do negatives w/ buddy assist or stop.

Strength Training Resources

Cross Fit

The Cross Fit program has recently become popular among Soldiers. Cross Fit is advertised as a program designed for elite athletes including special operations military units, police academies, and tactical operations teams. This program is accessed online and at certified Cross Fit gyms nationwide. As advertised, it is a broad program for strength training. The basic concept behind a daily workout is to complete a set number of repetitions of each exercise with minimum rest as quickly as possible.

Overall, Cross Fit includes good exercises and variety. Some cautions:

1. Be an informed consumer.
    - Before basing your fitness program upon principles advertised by Cross Fit, check the soundness of these principles with a medical professional.
    - Many of the principles advertised online by the Cross Fit program are physiologically unsound and can lead to injury.
2. NEVER sacrifice your form, even if only using light weights, for speed. See Appendix A for proper weight lifting form. Some keys to remember:
    - When squatting or lunging, never let your knees move farther forward then your toes. Your shins should be straight up and down, not tilted forward. Always be sure you can see your toes.
    - When bending at the waist, always keep the small of your back arched (stick out your bottom).
    - Never let your elbows move behind your shoulders when your arms are out at the side (i.e. bench press – elbows should not move below shoulders and fly's – elbows should stay in front of or parallel with shoulders)
3. NEVER exercise to muscle failure. Muscle failure is different from muscle fatigue.
    - You reach muscle fatigue once you can no longer exercise with proper form. Continuing with improper form beyond the point of muscle fatigue is muscle failure.
    - At this point, you should instead switch to a modified form of the exercise so that you can still maintain proper body mechanics and form (such as push ups on your knees).
    - When you reach muscle failure and continue the exercise with improper form, you are exposing your non-contractile tissues such as ligaments and capsules to the risk of injury. When torn, these tissues require surgery for repair.
4. Ensure your diet includes an adequate amount of carbohydrates, since this type of workout is anaerobic in nature, and carbohydrates is THE ONLY source of energy (3 types: carbohydrates, fat, and protein) that can be processed by your body during anaerobic exercise.

The Sixties

This method of exercise is designed to affect strength, quickness, and endurance. The progress in each area can be tracked with very simple documentation. Results = **Power**!

Power – Strength x speed. Recent research shows that resistance training at a fast pace provides significant strength benefit over training at a traditional pace (such as 3 sets of 12 reps of each exercise).[15]
Both strength and speed are affected in this method. Based on your present quickness (reaction times) and starting with your present strength levels. Strength will be increased without loss of quickness.
Cardiovascular Fitness – This method of exercise increases the anaerobic and aerobic capacity while strengthening the muscles.
Endurance – Exercise with high repetitions to increase endurance while increasing strength at the same time. Enhanced aerobic and anaerobic capacities.
Painless – (or near painless) The high repetition and low resistance of this system creates a high cardiovascular workout and assists in the removal of lactic acids from the exercised muscle groups, as well as not causing microtears within the muscle fibers. This effectively eliminates delayed onset muscle soreness (DOMS) from the workout.

METHOD:

1. Select 6 – 8 exercises.
2. On a worksheet, record the exercises, in a circuit.
3. Determine a starting weight by using 1/3 of the weight you can lift once.
4. All exercises are done at one rep per second. (i.e. 60 reps in 1 minute)
5. Any exercise that has less than forty (40) reps per minute needs to have the weight reduced to allow 60 reps per minute.

GOALS:

1. Increase rep speed to 60 reps per minute.
2. Do **no less** than six (6) different exercises in each circuit.
3. Progress sessions to three (3) circuits per session.
4. When the 60 reps per minute speed is reached through 3 circuits of an exercise, increase the weight of **that** exercise by twenty percent (20%). (*Note: Should rep speed drop below 40 reps per minute, then decrease the weight being used.*)
5. After 8 weeks of this system, maintenance workouts can be done once a week.

[15] Munn J, Herbert RD, Hancock MJ, Gandevia SC. Resistance training for strength: effect of number of sets and contraction speed. Medicine & Science in Sports & Exercise. Sep 2005;37(9):1622-1626.

INSTRUCTIONS:

1. After having progressed weights for 5-6 weeks, rep speed can be increased by small increments instead of increasing the weight. Also, quicker movements increase *POWER*.
2. Test increases in strength every couple of weeks with 1 rep max of each area of exercise.
3. Blood pressure and pulse rates can also be monitored before and after each session.

EXAMPLE WORKSHEET:

DATE:

Exercise	Weight	# of reps	# of reps	# of reps

DATE:

Exercise	Weight	# of reps	# of reps	# of reps

Aerobic Training

Choose ONE per aerobic training session

1. Footmarch

Footmarches should be performed no more than 3 times per 14 days and no fewer than 1 time per 14 days. Footmarches should be progressed in mileage by no more than ½ mile per march and no more than a 10% increase in weight per week.

Frequency	Intensity	Duration	Rest	Other
• No more than 1 FM every 3 days • No less than 1 FM every 14 days • Minimum 30 miles each month • Minimum 2 non-impact days follow each FM: FRIDAY is a great choice for FM day	• 3 MPH (20 min / mile)	• Minimum FM distance 10 miles for healthy Combat Arms Soldiers • CS and CSS Soldiers should start with shorter distances to allow for conditioning; see p. 82	• 10 min rest after every 3 miles	**Uniform** • ACUs • ACH • Ruck • Weapon • Boots -FM is the training event for the day -Incorporate CTT/EIB tasks into FM -FM conducted at Platoon or Company level

2. Ability group runs

Ability group runs should be performed in small groups with no more than a 1 minute separation between the fastest and slowest person in the group with the APFT 2 mile run time as the reference standard. These runs should be carried out at a conversational pace and be between 20-35 minutes in duration. Ability group runs can also be carried out on a trail, also at a conversational pace and for the same duration. Do not do trail runs in the dark.

3. Swimming

Make every effort to get your unit pool time. Lap swimming is a great non-impact option for tough cardiovascular training.

4. Gym machines

If available, using gym machines such as the elliptical machine, Nordic Trek, stairmaster, treadclimber, rowing machine, or versa-climber are great ways to get a solid aerobic workout without impact.

5. Biking

Stationary biking at the gym or biking with actual road/mountain bikes is another non-impact aerobic exercise option that adds challenge and variety to your training program. MWR rents mountain bikes for a few dollars per day. Below are some intense stationary cycling workouts to use during PT.

HIGH INTENSITY BICYCLING: Beginner			
Interval	**Resistance**	**Revolutions per Minute (RPM)**	**Time**
Warm up	Light (1 KP)	85 RPM	2:30
Work	Medium (2 KP)	90 RPM	1:30
Rest	Light	75 RPM	1:30
Work	Medium	90 RPM	1:30
Rest	Light	75 RPM	1:30
Work	Medium	90 RPM	3:00
Rest	Light	75 RPM	3:00
Work	Medium	90 RPM	3:00
Rest	Light	75 RPM	3:00
Work	Medium	90 RPM	3:00
Rest	Light	75 RPM	3:00
Work	Medium	90 RPM	1:30
Cool Down	Light	85 RPM	2:30
		Total Time:	**30:30**

HIGH INTENSITY BICYCLING: Advanced			
Interval	**Resistance**	**Revolutions per Minute (RPM)**	**Time**
Warm up	Light (1 KP)	85 RPM	2:30
Work	Heavy (2.5 KP)	90 RPM	1:30
Rest	Light	75 RPM	1:30
Work	Heavy	90 RPM	1:30
Rest	Light	75 RPM	1:30
Work	Heavy	90 RPM	3:00
Rest	Light	75 RPM	3:00
Work	Heavy	90 RPM	3:00
Rest	Light	75 RPM	3:00
Work	Heavy	90 RPM	3:00
Rest	Light	75 RPM	3:00
Work	Heavy	90 RPM	3:00
Rest	Light	75 RPM	3:00
Work	Heavy	90 RPM	1:30
Cool Down	Light	85 RPM	2:30
		Total Time:	**36:30**

Notes:

1. **Resistance on a Monarch stationary bike:**
   Light = 1 KP
   Medium = 2 KP
   Heavy = 2.5 KP
2. **Resistance on a different stationary bike:**
   Light = lower the resistance so that you can comfortably maintain the listed pace but not so low that you bounce
   Medium = Moderate to strenuous effort to maintain the listed pace
   Heavy = If you turn up the resistance any further, you cannot maintain the listed pace
3. **Revolutions per Minute (RPM):**
   RPM = number of times your left foot goes down per minute

Anaerobic Training

1. 30/30 runs

An effort lasting about 15 to 30 minutes with 30 seconds sprinting followed by 30 seconds walking or jogging continuously.

2. Track intervals

There are many options. Below are a few examples.

- Quarter repeats: Repeat 4-8 times
  - 400m @ 5-7 sec per quarter faster than 2 mi pace
  - Rest time = 400m time
- 200m turn & burn: Repeat 10-15 times
  - 200m @ 10 sec per 200m faster than 2 mi pace
  - Start one repeat every 90 seconds
- Ladder drills:
  - 1 mile @ 2 mile run pace, walk/jog 1 lap
  - 800m @ 5 sec faster per quarter mile than 2 mile run pace
  - 400m @ 7 sec faster per quarter mile than 2 mile run pace
  - 200m @ 10 sec faster per 200m than 2 mile run pace
  - 400m @ 7 sec faster per quarter mile than 2 mile run pace
  - 800m @ 5 sec faster per quarter mile than 2 mile run pace

3. Short hills

- 30 seconds to 1 minute duration hills at > 7% grade, repeated 6-15 times with twice the duration of the hill as recovery.
- One example: the steep hill towards Gate 10 on the footpath (go for time or distance).

4. Long hills

- 1 minute in duration at <7% grade, 3-6 repeats. Recovery time = twice the duration of the hill.
- One example: the long hill towards Cav Country on the footpath (again, go for time or distance).

5. Fartlek (in ability groups)

- Warm up, then alternate speed play at durations of 30 seconds to 3 minutes with recovery jogging afterwards. This should be a continuous running effort for 25-35 minutes at a variety of speeds. Speed play should be at 70-90% HRmax or 16-19 points on the RPE scale.

6. Tempo run

- 5-10 minute warm up, 15 minute tempo run (at a pace 30 sec slower than 2 mi run pace), 5-10 min cool down

Speed and agility drills- no equipment

30-50m Drills: Pick 5-10 and perform 3-5 of each

1. Butt Kickers

- Start from a slow jog then gradually increase the tempo with the runner allowing the lower leg to rise up and back so that the heels touch the butt. Allow, but don't force the heels to the butt. The thigh moves very little in this drill. This is not a sprint. Maintain a fully upright trunk with strong but smooth arm swing.

2. Fast Leg Drills

- Similar to butt kickers, but involve slow running with regular, quick kick backs of the heel to the buttock. It can involve a single leg or alternating movements. For example, jog 30-40 yards with the left leg only kicking quickly back so the heel touches the butt. Return using only the right leg for the kickback. It promotes quickness of the hamstrings.

3. Verticals

- Promote a strong running posture. Keep a tall stance with a stable, upright trunk as you bring the hips quickly to 90 degrees flexion. (Knees don't rise above waist level.) Ground contact should be primarily with the balls of the feet and should be fairly explosive. Unlike butt kickers and the fast leg drill, there is no backswing of the legs for this drill, though the heels may graze the butt. This drill promotes good alignment and keeps the legs to the front.
- Pretend there is a wall running down your back to the ground may help you keep the legs to the front. Arm swing is strong and smooth.

4. Quick-Feet Drill

- This drill is a natural follow-up to verticals. Jog ten yards, then keeping the same rate of forward movement, take as many steps as possible for ten yards using the form you learned to do verticals. At the 20-yard mark jog, and then at 30 yards start the quick feet drill again. End at 40 yards.

5. Pull-Throughs

- Involve 1) extending the front leg up and forward like a hurdler, then 2) pulling the leg through ground contact in a powerful but smooth motion. This drill looks like a running goose-step.

6. Ankling

- Involves quickly springing off the ball of the foot with minimal bend of the knee. It promotes explosive quickness of the calf muscles. It can be done with alternating legs, or right right left left.

7. Quick Skip

- Keep your feet very low to the ground and take small skipping steps as quickly as possible.

8. Power Skip

- Skip as high and as far as possible with each step.

9. Bounding with Hang Time

- Involves running with exaggerated airtime due to an explosive push off with each step.

10. Mountain Climber Sprints

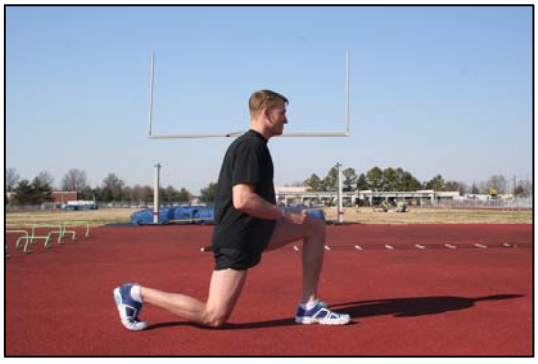
- Use elastic energy to promote a fast start. Do a normal mountain climber and on the third or fourth count go into a sprint.

11. Accelerations

- Are done by running at about 50 % max then, at a given point, sprinting to max. At the point of acceleration, lean the body slightly forward, bring power into the arm swing, and use a powerful rear-leg push-off to increase stride length.

12. Lunging

- Lunge forward with each step (walking). Make sure your knee never goes past your toes with each step and you keep your back straight up and down.



13. Lunge-ups

- Lunge forward with each step. When you come back up, come up onto your toes. Make sure your knee never goes past your toes with each step and you keep your back straight up and down.

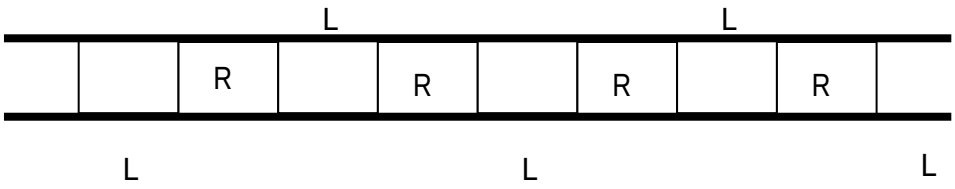
Note: Remember, all of these drills should be preceded by a very complete warm-up.

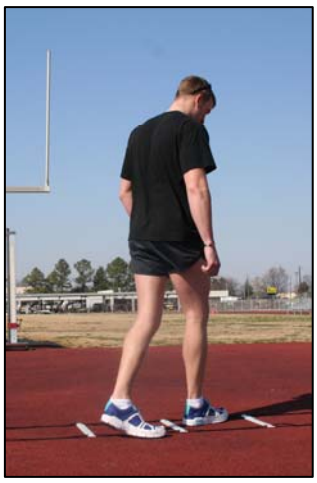
These are just a few examples; the options are limitless!

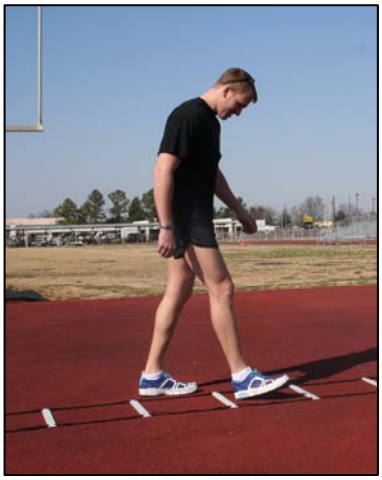
Speed and agility drills- with ladder or hurdles

1. Ladder weave

Run through the ladder, weaving with the left foot to the right of the ladder then right foot in the ladder, then the left foot to the left of the ladder, then the right foot in the ladder, and repeat.

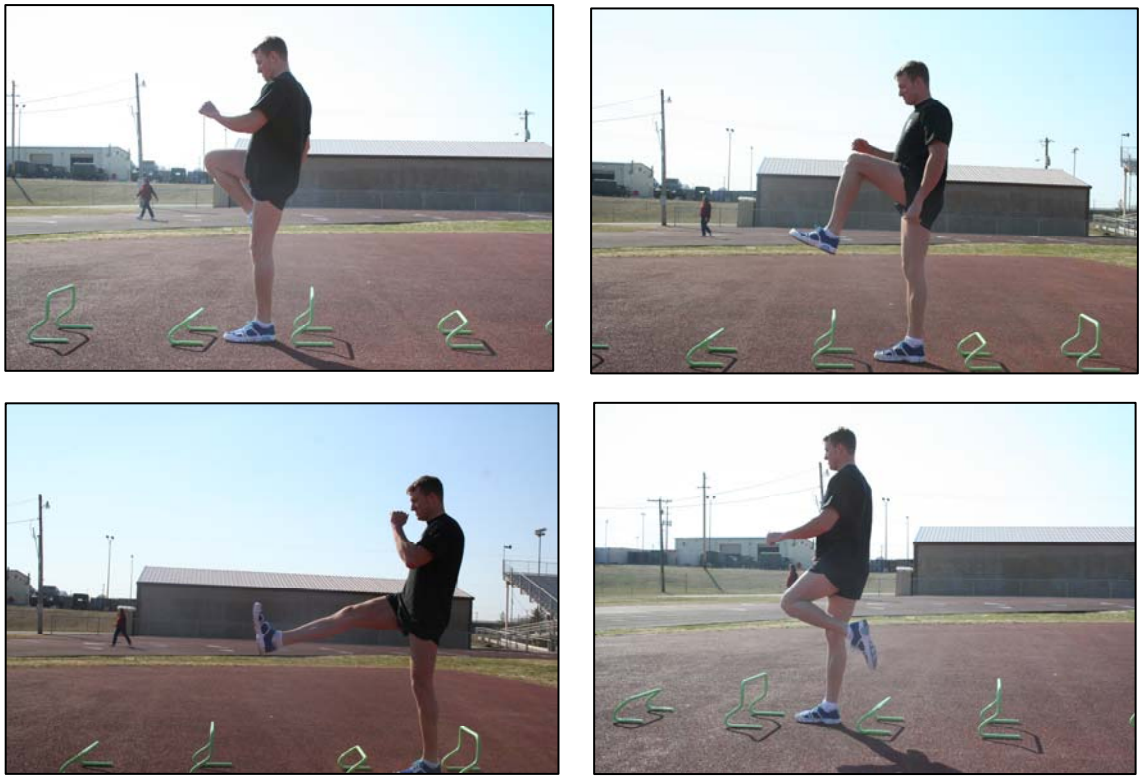






2. Kick step over hurdles (can also be done with ladder)

Kick your leg out straight forcefully with each step.



3. Double leg hop over hurdles (can also be done with ladder)

Jump over the hurdles with both legs together. As you hit the ground with each jump, immediately begin into the next jump without stopping or double bouncing.

4. Lateral hops over hurdles (can also be done with ladder)

Jump diagonally over the hurdles, landing on alternating sides of the hurdles. Again, as soon as you land, go right into the next jump without pausing or double bouncing.

5. Power jumps over hurdles (can also be done with ladder)

A variation of the double leg hop over hurdles, jump as high as you can over the hurdles, going right into your next jump when you land without pausing or double bouncing.

These are just a few examples; the options are limitless!

Here are some additional resources:

1. http://www.sport-fitness-advisor.com/agilitydrills.html
2. http://www.performbetter.com (go to "Training Zone")

Medicine Ball Drills

1. Squat-thrust

- Hold medicine ball with both arms, squat down, come back up as you toss the ball to your partner.




2. Side pass

- Sit back to back with a buddy and pass the ball to each other one side, then the other, for time intervals


3. Standing side pass

- Sit back to back with a buddy and pass the ball to each other one side, then the other, for time intervals

4. High side pass, seated

- Sit back to back with a buddy and pass the ball to each other one side, then the other, for time intervals. This time, pass over the shoulder.

5. Chest pass + shuffle

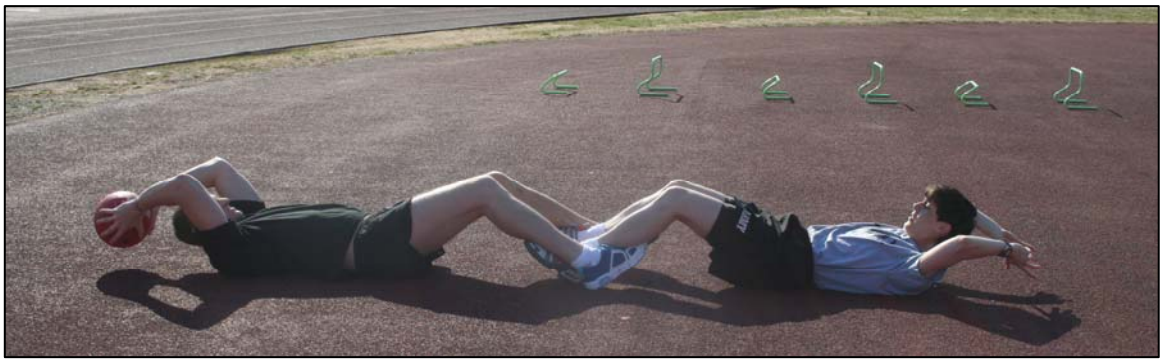
- As you shuffle sideways across from a buddy, pass the ball back and forth with a chest pass

6. Lateral toss + shuffle

- As you shuffle sideways across from a buddy, pass the ball back and forth with a lateral toss

7. Sit up + chest pass/overhead pass

- Link ankles with a buddy in the sit up position (facing each other). As you sit up, toss the medicine ball to your buddy either with a chest pass or overhead (overhead shown below). Your buddy catches the ball as he returns to the down position, then passes it back as he sits up



8. Over and under pass

- Stand back to back with a partner and pass the ball over your heads then under your legs.

8. Side to side tap

- Sit with your knees bent and your heels on the ground. Lean your torso back. Quickly tap the medicine ball on one side of you, then the other.

6. Push ups on medicine ball

- Both hands on one ball, or each hand on a medicine ball, or one hand on one ball and the other on the ground

These are just a few examples; the options are limitless!

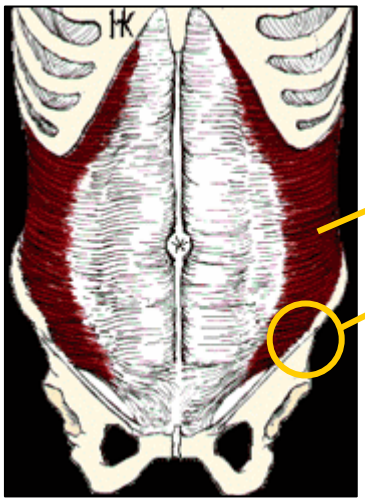
Here are some additional resources:

1. http://www.performbetter.com/catalog/assets/Exercisesheets/PDF/MedBall%20Handout.pdf
2. http://www.sport-fitness-advisor.com/medicine-ball-exercises.html

Core and balance training

1. Transversus abdominus contraction

This is the basic contraction for core muscle strengthening and should be incorporated into each of the following exercises. Your transversus abdominus creates a weight belt of muscle within your abdomen and back; it is the deepest abdominal muscle and wraps around to your spine. Transversus abdominus activation and strengthening is VITAL to core strength and the prevention of back pain.



Transversus Abdominus

Front hip bone (ASIS)

A proper transverses abdominus contraction is very subtle. It involves pulling your belly button towards your spine using only muscle and not sucking in. To tell if you are doing the contraction correctly, place your hand on your front hip bone (see diagram above). Move your hand in towards your belly button 1 inch. When you contract you should feel a deep tension, not your muscles pushing outward towards your hand.

Here is a plan to use when integrating these exercises into your PT program. Choose 3 exercises each time you do core strengthening (you can choose different exercises each time) and perform to the below standards.

CORE STRENGTH: Pick 3							
Week	**Back Extension**	**Crunches**	**Situps**	**Plank**	**Plank Push Up**	**T-Stance**	**Cobra**
1	10	3 x 101	1:00	:20	:30	:20	10
2	10	3 x 101	1:30	:30	:30	:20	10
3	20	2 x 202	2:00	:40	:30	:20	10
4	20	2 x 202	2:00	:50	:45	:20	10
5	2 x 15	3 x 202	2:20	1:00	:45	:25	10
6	2 x 15	3 x 202	2:20	1:20	:45	:25	10
7	2 x 20	3 x 202	2:40	1:40	1:00	:25	10
8	2 x 20	2 x 303	2:40	2:00	1:00	:30	10
9	2 x 25	2 x 303	3:00	2:20	1:00	:30	10
10	2 x 25	3 x 303	3:00	2:40	1:15	:30	10
11	2 x 30	3 x 303	3:20	3:00	1:15	:30	10
12	APFT						

Notes:
1. Choose the most difficult variety of the plank that you can maintain for the standard time listed.
2. When performing cobras, relax all of the muscles in your body except for your arms. When your arms are completely locked out at the top of the cobra, breathe out and let your stomach sag for one second. Return to start position and repeat.

2. Plank on elbows and toes (original plank)

Hold for a goal of 30 seconds working up to 3 minutes. If you have back pain, don't sag in the middle; either keep your back straight or push your hips upward. To add challenge, lift one foot 3 inches off the ground.

3. Plank with arms forward

Hold for a goal of 30 seconds to 3 minutes, just like the original plank, but move your arms forward.

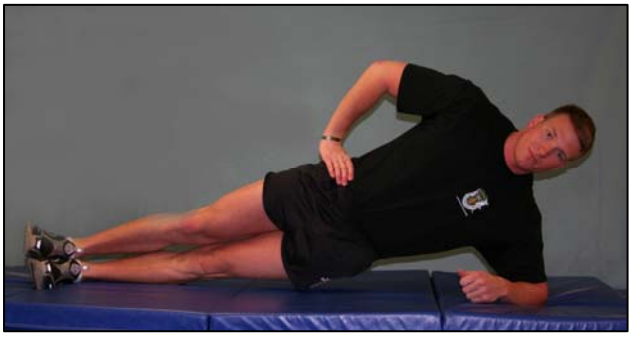
If you have back pain, either keep your back straight or push your hips upwards; don't sag in the middle.

4. Plank on toes

Hold for a goal of 30 seconds to 3 minutes, just like the original plank, but move up onto your toes.

5. Plank on side

1. Make your body into a perfect L shape with your knees, hips, and shoulders making a perfect line and your feet behind you. Come up onto your elbow and tighten your core muscles. Hold for a goal of 30 seconds, each side.



2. To add challenge, perform the same exercise with your legs straight. Hold for a goal of 30 seconds, each side.

3. To add even more challenge, perform the same exercise with your legs straight and your elbow straight. Hold for a goal of 30 seconds, each side.

4. To add still more challenge, perform the same exercise with your legs straight and your elbow straight. Straighten the other arm out above you too. Hold for a goal of 30 seconds, each side.

5. Most challenging: star position. Straighten the other leg out to make a star. Hold for a goal of 30 seconds, each side.

6. Star or T push up without resistance

1. Start in the front leaning rest position

2. Get into the push up position

3. Come up into the T position or star position

4a. T position

4b. Star position

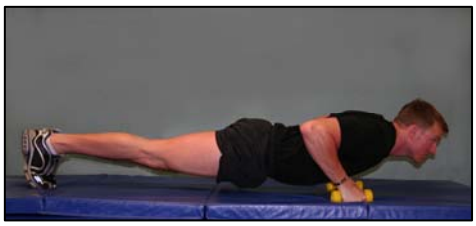
5. Return to the front leaning rest and repeat to the opposite side.

7. T push up with resistance

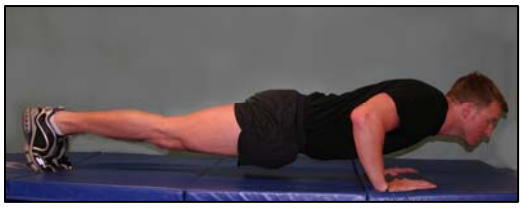
With dumbbells

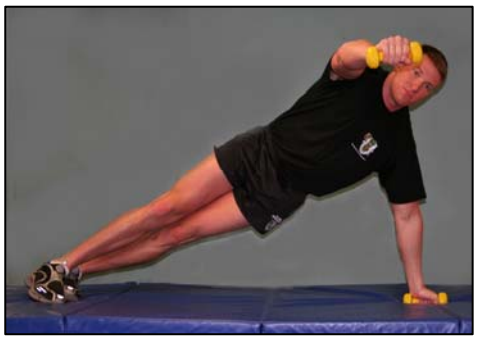
With tubing

1. Start in the front leaning rest position



2. Get into the push up position





3. Come up into the T position

4. T position

5. Return to the front leaning rest and repeat to the opposite side.

8. Pike push up: One foot up during push ups

1. Start in the front leaning rest position

2. Get into the push up position

3. Lift one leg up

4. Keeping one leg up, go back down into the front leaning rest position

5. Put both feet down. Repeat with the other leg.

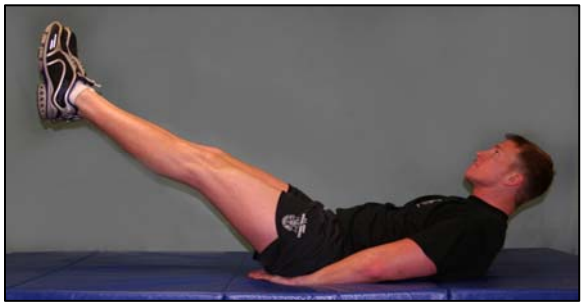
9. Back extension (row)

1. Start laying face down, arms and legs extended.

2. Bring your chest off of the ground as you pull your elbows back. Keep your feet on the ground.

3. Return to the start position and repeat.

10. Double leg lift



1. Start laying on your back with your hands under your buttocks and your feet 6 inches off the ground

2. Keeping your legs straight, bring them up to a 45 degree angle. Make sure the small of your back remains in contact with the ground

3. Return to the start position. Again, make sure the small of your back is still in contact with the ground

11. Bridge: Varying levels of difficulty

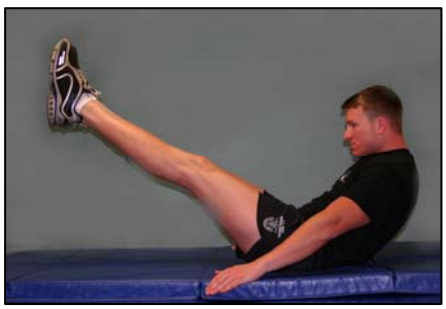
LEVEL 1: Laying on your back with your knees bent, contract your core muscles, then bring your hips up. Try to hold for 30 seconds to 3 minutes.

LEVEL 2: Laying on your back with your knees bent, contract your core muscles, then bring your hips up. Now straighten one leg. Keep your hips level (don't let one hip dip down). Try to hold for 30 seconds to 3 minutes.

LEVEL 3: Same as level 2, but now extend your arms behind you. Hold them 6 inches from the ground. Try to hold for 30 seconds to 3 minutes.

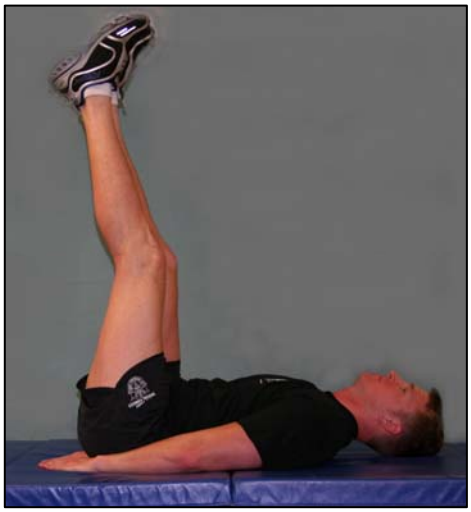
12. V-up

1. Laying on your back with your legs straight in front of you and your arms outstretched (in a T shape).

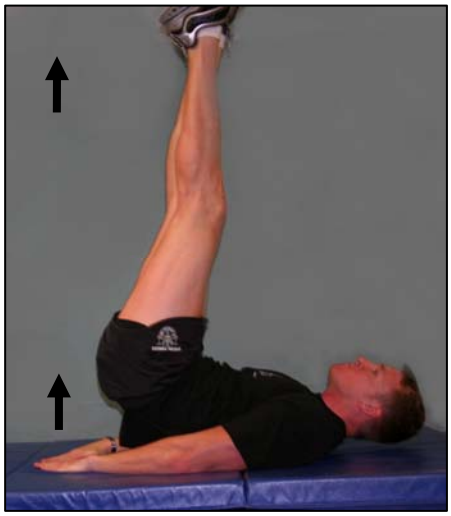


2. Come up into a V shape by sitting up and bringing your legs straight up to a at the same time. Also, bring your arms forward, to a 45-degree angle on the ground. Repeat.

13. Reverse pike

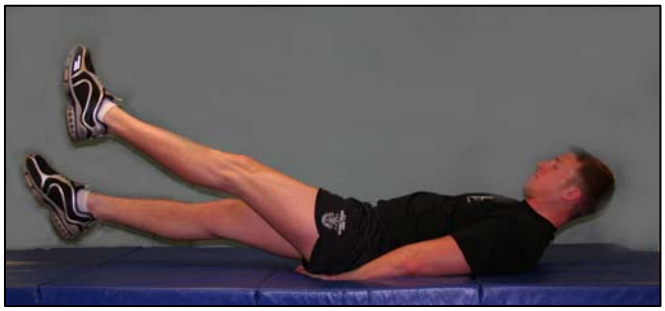


1. Start lying on your back with your legs straight up in the air and your hands on the ground at your side.



2. Lift your hips up off the ground without tilting your legs backwards. Keep them pointed straight upwards. Repeat.

14. Flutter kicks



<u>Proper Flutter kicks</u>

The key to proper flutter kicks that won't hurt your back is to keep the small of your back touching the ground.

The second it comes off the ground, you're no longer working your abdominal muscles, just your hip flexors, and your back is trained.

If the small of your back leaves the ground, stop and change to another exercise.

15. Swimmer kicks

1. Start sitting with your hands just behind your hips and your knees bent so your heels touch the ground

2. At the same time, lean your torso back and straighten your legs. Don't let your feet hit the ground.

3. Bring your torso back to the start position and tuck your knees towards your chest without letting your feet touch the ground. Repeat steps 2 and 3 for 20-50 reps.

To add challenge, keep your hands off the ground during the swimmer kicks

16. Crunch

1. Start on your back with your knees bent and your feet flat on the ground, arms crossed over your chest.

2. Lift your shoulder blades off the ground just until the tips of your shoulder blades come off the ground. Return to the start position and repeat.

17. Double crunch

1. Start on your back with your knees bent and your feet flat on the ground, arms crossed over your chest.

2. Lift your feet off the ground and your shoulder blades off the ground just until the tips of your shoulder blades come off the ground.

3. Tuck your legs so that your hips and knees are at right angles. Bring your torso up higher so that your elbows touch your thighs.

4. Return to step 2, then repeat steps 2 and 3 for 20-50 reps.

18. Supine twist

1. Start on your back with your arms outstretched and your knees and hips bent at right angles

2. Twist your torso to the left so that your left knee almost touches the ground (but don't touch the ground!)

3. Return to the start position

4. Twist your torso to the right so that your right knee almost touches the ground (but don't touch the ground!)

5. Return to the start position and repeat steps 2-4 for 10 -30 reps

19. Reverse sit-up: for returning to sit-ups after an injury



1. Use your hands to pull yourself into the up position of a sit-up



2. Cross your arms across your chest and lower back down into the start position. Repeat for 10-30 reps

Injuries

Causes of Overuse Injuries

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

1. **Training Errors**: the majority of injuries are due to training errors
    a. Overtraining: No Pain....No Gain = **No Good**
    b. Inappropriate exercises, not designed with battle simulation in mind
    c. No recovery period
    d. Inappropriate training surface- uneven terrain, slanted road margins
    e. Improper shoes- shoes >6months, not designed for running (vans, sketchers, cross trainers)
2. **Foot Biomechanics:** high arch or over supination /over pronation
3. **Muscle Tightness:** hamstrings, calf/Achilles tendon, IT band or buttocks/hip muscles
4. **Muscle laxity or joint laxity**: Too flexible
5. **Muscle Weakness**: quadriceps (causes pain behind or around the knee cap)
6. **Poor ergonomics (body mechanics):** improper lifting techniques (i.e. with litter carries or fireman carries)

*If a Soldier has an injury, he/she needs to make an appointment to see their primary care provider or physical therapist. Between the time of injury and the scheduled appointment, they can begin working on the exercises on the handouts in **Appendix B**. If any of the exercises are painful, the Soldier should **STOP** and let the medical provider know.

Who Gets Injured?

1. Beginning runners, enthusiastic and out of shape, run too often, too fast, or on hard and uneven surfaces
2. Soldiers wearing poorly made shoes
3. Experienced athletes motivated to achieve a new goal incur overuse or stress injuries when increasing mileage or speed 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

Common Lower Extremity Overuse Injuries

Injury	Causes	Medical Treatment (from Physical Therapist, MD, PA, Medic)
BACK PAIN	• 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) • Poor lifting techniques • Poor equipment ergonomics • Muscle imbalances (abdominal and/or back muscle weakness)	• Relative rest from aggravating activity • NSAIDS (Motrin, Naproxen, etc) • Stretching handouts – hip flexors and hamstrings • Changing running shoes/ ordering orthotic inserts for shoes and boots • Education on appropriate lifting and positioning techniques for everyday activities to work related tasks • Strengthening core trunk muscles
HIP PAIN Examples include trochanteric bursitis (AKA IT band syndrome, which can also affect the knee) and snapping hip syndrome	• High arches with improper running shoes for foot type or old running shoes • Tight muscles or tissue crossing hip joint • Weak hip muscle – hip flexors or gluteal muscles (glut medius) • Over training and not cross training between high impact and low impact aerobic exercises	• Relative rest from high impact aerobic exercises- i.e. running • Stretching muscles such as hip flexors or quadriceps or tight tissue such as Illiotibial band • Strengthening hip and gluteal muscles • Replacing running shoes • Anti-inflammatory medications
ANTERIOR KNEE PAIN Example: patellofemoral pain syndrome, better known as "runners knee," which affects 10% of all active adults	• Weak quadriceps or weak hip muscles • Tight Iliotibial band (ITB), lateral (outside) quadriceps, or lateral soft tissues • Tight hamstrings or calf muscles • Poor foot mechanics (supination, pronation) • Poor squatting or lunging mechanics • Excessive overuse/training/sports- (running too far, too fast, too frequently)	• Relative rest from aggravating activity (ies): repetitive squatting/lunges/prolonged sitting in cramped space, high impact-jumping, running, or footmarches. • NSAIDS • ICE • Stretching handouts – hip flexors, hamstrings, calf muscles, ITB, • Orthotic insert for shoes to alter poor foot mechanics
LATERAL KNEE PAIN Example: iliotibial band syndrome (ITBS)	• Tight illiotibial band (ITB) – a piece of flat tissue running from the lateral thigh (hip region) to below the knee • Musculoskeletal deformity- bowlegged with flat feet • Leg length discrepancy (one leg longer than the other) • Excessive hill running • Running on slanted road margin (same leg always impacting the higher side of the road) • Rapid increase in frequency/ duration/ intensity of runs in a short amount of time (<1 month)	• Rest • Icing or NSAIDS • Stretching ITB • Replacing old running shoes (over 6 months or more than 500 miles) • Orthotic inserts for shoes • Core trunk, pelvis, and hip muscle strengthening

Injury	Causes	Medical Treatment (from Physical Therapist, MD, PA, Medic)
JUMPER'S KNEE Also known as patellar tendonitis	• Tight hamstrings and/or calf muscles • Weak quadriceps • Running on hard surfaces • Jumping (repetitively) on hard surfaces (i.e Basketball) • Hard downhill running • Overtraining	• Rest • Icing and NSAIDs • Stretching hamstrings, calf muscles • Strengthening quadriceps/hamstrings
SHIN SPLINTS	• Tight calf muscles and/or weak anterior leg muscles • Excessive pronation (flat foot or low medial arches) • Running on hard or curved slanted surfaces • Worn out or improper running shoes for foot type • Increasing speed and distance too quickly	• Relative rest from aggravating activities • Icing, or NSAIDS • Stretch calf muscle • Strengthening anterior leg muscles (i.e. foot tapping exercises) • Shoe orthotics or inserts • New running shoes appropriate for foot type
STRESS FRACTURES	• Overtraining (insufficient recovery time b/w workouts) • Weighting down body with running (wearing IBA with plates) • Excessive hill running • Running in formation (too slow or too fast) • Running in boots • Overstriding (short runners with tall runners)	• ABSOLUTE Rest from impact activities (running, jumping) or prolonged activities (long periods of standing or walking) • Crutches • Casting • Surgery (pinning the bone) – worst case
ACHILLES TENDONITIS	• Overtraining • Running on hills • Shoes with low heel height or raised toe height • Excessive pronation • Tight hamstrings and/or calf muscles (squat down and heel lift off ground)	• Rest • Icing/ NSAIDS • Stretch hamstrings and calf muscles • Heel lift • Night splints • Moleskin inside back of boots to reduce shear friction (rubbing), may require soft shoes
HEEL or FOOT PAIN Examples include plantar fasciitis and calcaneal fat pad syndrome	• Overuse • Flat foot or high arches • Toe running • Running on hills or soft compliant terrain (in sand, mud, or gravel) • Sudden weight increase • Walking without shoes on hard surfaces	• Rest • Ice/NSAIDS • Stretching calf and foot muscles • Heel pads • Orthotic shoe inserts • Changing foot wear – may require soft shoes with ACUs • Night splints

Common Upper Extremity Overuse Injuries

Injury	Causes	Medical Treatment (from Physical Therapist, MD, PA, Medic)
NECK STRAIN/ PAIN Examples include whiplash, crick in neck, "pinched" nerve	• Motor vehicle accident • Sleeping in awkward position or on flat /overstuff pillow • Stress • Poor posture while at computer • Quick sudden movement or strain	• Range of motion exercise to move neck –side to side, up and down • Anti-inflammatory medications • Strengthening neck muscles with specific exercises directed by physical therapist • Moist heat or ice depending on onset if recent • Postural correction • Adjusting work station – desk height, computer screen to match eye level
SHOULDER IMPINGEMENT SYNDROME Examples include supraspinatus tendinitis, biceps tendinitis, shoulder bursitis	• Upper body lifting or training to muscle failure (i.e. 101 push-ups, pull-ups, excessive rope climbing) • Repetitive overhead activities and/or lifting without gradual progression • Rotator cuff weakness	• Activity modification-no lifting above shoulders, no push-ups • Shoulder stretches and strengthening • Strengthen rotator cuff muscles • Rest, ice or heat, aspirin or NSAIDs
ELBOW PAIN - MUSCLE/TENDON INJURY Examples include tennis elbow (lateral epicondylitis) and golfer's elbow (medial epicondylitis)	• Repetitive wrist extension (tennis elbow) or flexion (golfer's elbow) • Repetitive gripping/lifting heavy objects • Not warming-up properly • Infrequent rest breaks	• Wrist and forearm stretches • Activity modification • Forearm strap and/or wrist splint • Rest, ice, aspirin or NSAIDs
ELBOW PAIN - NERVE INJURY	• Excessive pressure on ulnar nerve (funny bone) • Repetitive flexing of elbow • Constant bumping of ulnar nerve • Sleeping with elbows and wrists flexed	• Wrist and forearm stretches • Avoid irritation by using elbow pad and • Avoid aggravating movement with forearm • Rest
WRIST PAIN One example: carpal tunnel syndrome	• Repetitive motion (flexing or extending the wrist) i.e. push ups or typing • Excessive vibration • Infrequent rest breaks	• Wrist stretches • Wrist splint and/or activity modification • Rest, ice, aspirin or NSAIDs
THUMB/WRIST PAIN One example: DeQuervains tenosynovitis	• Excessive grasping and pinching activities with thumb • Infrequent rest breaks • Tight forearm muscles	• 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 (0-3wks)- until pain and swelling are controlled:

Rest is essential to prevent further injury and to allow ligaments, muscles, bones to recover.

> **Rest** does not equate to immobilization but **DOES** mean avoiding any activity that causes further pain or swelling.
> Soldiers may be placed on crutches to assist the healing process - they must USE THEM. While using the crutches, they should use them as prescribed by the medical provider who issued them

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. For ice massage, freeze water in a paper or styrofoam cup, then rub directly on the injured area for 7-10 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 or TED hose/stocking. 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 or prolong the current injury.

Heat vs. Ice

Many people are confused about the choice of heat versus ice treatment as a way of decreasing pain and/or the symptoms resulting from injury (i.e. swelling). Use the following chart to help decide:

	HEAT	VS	ICE
Circulation	**↑s blood flow, ↑ing Bruising**		**↓blood flow, ↑bruising**
Pain	**Initially soothes**		**Initially discomfort then numbness f/b anesthesia x 30 min**
Muscle Spasm	**Mild ↓ initially, not lasting**		**Marked ↓, secondary action on muscles and ↑ after 30 ,min**
Swelling	**↑**		**↓**
Metabolism	**↑**		**↓**
Depth	**Swallow, deeper with US(ultrasound)**		**Deeper with ice massage or ice pack**

To summarize:

ICE /COLD when:

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

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

"Rule of thumb"

when in doubt, use ICE.

Common Venues for Traumatic Injuries

Body Part	Mechanism of Injury (MOI)	Typical Resulting Injury
BACK	• Airborne operations- parachuting • Litter or fireman carries with improper support or lifting techniques • Lifting heavy object (greater than 30#) and twisting/rotating trunk quickly	• Spinal cord injury • Facet dysfunction (stuck in one position unable to move) • Severe muscle spasm and pain • Severe disc bulge or rupture • Compression fracture
HIP	• Airborne operations to include falling off high platform or parachuting • Combative training in which leg pinned or impact in awkward positions • Sprints or hill drills without proper warm up or progression	• Hip dislocation • Femur neck or hip fracture • Femur fracture (upper thigh bone) • Groin strains • Hip flexor strains
KNEE	• Sports such as basketball, football, or soccer any activity involving short runs, quick stops or sudden directional changes • Stopping quickly and pivoting with the foot planted • Tackling someone with force hitting knee • High jumping and landing with knee straight or in deep flexion (bent) • Combatives- pinning, twisting or impacting knee at awkward angle with high amount of force or leg being "side swiped" by opponent	• Anterior Cruciate Ligament (ACL) tear or partial tear • Posterior Cruciate Ligament (PCL) tear • Cartilage or meniscus tear • Rupture of popliteal artery in knee • Bone bruising • Fracture of tibia or fibula (lower leg bones)
FOOT / ANKLE	• Sports – basketball • Jumping and landing on inverted ankle (impacting outside of ankle) • Running or foot marching on uneven terrain especially if there is poor visibility • Heavy object(s) landing on ankle or foot	• Ligament tears in foot and ankle • Fractures of distal tibia or fibula (lower leg bones near ankle) • Fractures of metatarsals (foot bones) • Amputation of digit or toes
NECK	• Motor vehicle collision/impact – IED • Combatives- pinning or twisting neck in awkward position • Blunt force with object	• Spinal cord injury • Cervical fracture of vertebrae • Severe muscle spasm and/or pain • Loss of normal range of motion
SHOULDER	• Combatives- positioning or pinning arm in extreme range of normal motion • Falling directly on outside or lateral part of shoulder • Weight lifting – exceeding weight capabilities with bench press, dead lift, pull ups • Contact sports involving tackling	• Shoulder dislocation – typical with younger soldier • Shoulder separation • Rotator cuff tear(s) • Cartilage tears (labrum inside shoulder joint) • Severe tendonitis
ELBOW	• Falling with arm outstretched • Arm pinned in awkward position especially in motor vehicle accident	• Fracture of forearm muscles – radius or ulna • Nerve damage
WRIST / HAND	• Blunt force to wrist/hand-combatives or fighting • Heavy object landing on wrist or hand • Falling with arm outstretched • Contact with very intense heat sources – explosion, handing hot objects without protective equipment • Using sharp objects such as knives	• Carpal fractures • Burns • Ligament or cartilage injuries • Nerve damage- impairing writing or fine motor skills • Amputation of digit/finger

Head Injuries

Features of Concussion Frequently Observed

- Vacant stare (befuddled facial expression)
- Delayed verbal and motor responses (slow to answer questions or follow instructions)
- Confusion and inability to focus attention (easily distracted and unable to follow through with normal activities)
- Disorientation (walking in the wrong direction; unaware of time, date, and place)
- Slurred or incoherent speech (making disjointed or incomprehensible statements)
- Gross observable incoordination (stumbling, inability to walk tandem/straight line)
- Emotions out of proportion to circumstances (distraught, crying for no apparent reason)
- Memory deficits (exhibited by the Soldier repeatedly asking the same question that has already been answered, or inability to memorize and recall 3 of 3 words or 3 of 3 objects in 5 minutes)
- Any period of loss of consciousness (paralytic coma, unresponsiveness to arousal)

"Sideline" Evaluation

Mental Status Testing

Orientation	Time, place, person, and situation (circumstances of injury)
Concentration	Digits backward (i.e. 3-1-7, 4-6-8-2, 5-3-0-7-4) Months in reverse order
Memory	Recall of 3 words and 3 objects at 0 and 5 minutes Recent newsworthy events Details of the mission

Exertional Provocative Tests

40 yard sprint
5 push ups
5 sit ups
5 knee bends

Neurological Tests

Strength
Coordination and Agility
Sensation

Any appearance of associated symptoms is abnormal, i.e. headaches, dizziness, nausea, unsteadiness, photophobia, blurred or double vision, emotional lability, or mental status changes.

Grades of Concussion

Grade 1	*Grade 2*	*Grade 3*
1. Transient confusion (inattention, inability to maintain a coherent stream of thought and carry out goal-directed movements)	1. Transient confusion	1. Any loss of consciousness a. Brief (seconds) b. Prolonged (minutes)
2. No loss of consciousness	2. No loss of consciousness	
3. Concussion symptoms or mental status abnormalities on examination that **resolve in less than 15 minutes**	3. Concussion symptoms or mental status abnormalities (including amnesia) on examination **last more than 15 minutes**	

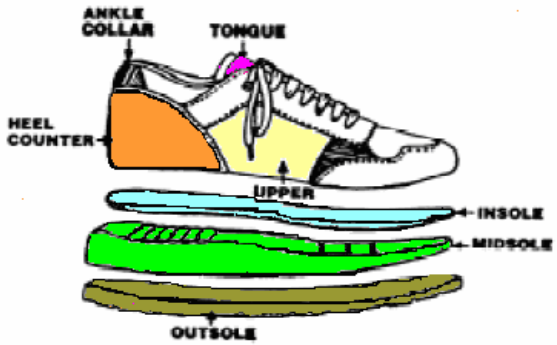
Management Recommendations

Grade 1	*Grade 2*	*Grade 3*
1. Remove from mission	1. Remove from mission and disallow return to duty that day	1. Evacuate Soldier to nearest medical treatment facility if still unconscious or if worrisome signs are detected (with cervical spine immobilization if warranted)
2. Examine immediately and at 5 minute intervals for the development of mental status abnormalities or post-concussive symptoms at rest and with exertion	2. Examine on site frequently for signs of evolving brain injury	2. A thorough neurologic evaluation should be performed emergently, including appropriate imaging (CT or MRI) when indicated (by medical provider)
3. May return to mission if mental status or post concussive symptoms clear within 15 minutes	3. A trained person should re-evaluate the Soldier the next day	3. Evacuation to the CSH is indicated if any signs of brain injury are detected or if the mental status of the Soldier remains abnormal.
	4. A physician should perform a neurologic exam to clear the Solider for return to duty after one full asymptomatic week at rest and with exertion.	

When to Return to Duty

Grade of Concussion:	**Return to Duty Only After Being Symptom Free with Normal Neurologic Assessment at Rest and with Exercise**
Grade 1 Concussion	15 minutes or less
Multiple Grade 1 Concussions	1 week
Grade 2 Concussion	1 week
Multiple Grade 2 Concussions	2 weeks
Grade 3 – Brief Loss of Consciousness (seconds)	1 week
Grade 3 – Prolonged Loss of Consciousness (minutes)	2 weeks
Multiple Grade 3 Concussions	1 month or longer, based on decision of evaluating physician

Running Shoes



Running Shoe Anatomy 101

Midsole:

Known as the life of the shoe, the midsole provides cushioning, control and comfort during running. It is located between the upper and the outsole.

- Protects against impact ground reaction forces
- EVA: light, not as durable
- Polyurethane: firmer, last longer
- EVA + PU= combination gives you best of both worlds
- Often uses GEL or Air technology

Basic Care

- The midsole takes 24 hours to recover from a run. Therefore, you can't use the same shoe to work out twice per day.
- If the midsole becomes wet, it will lose 50% of it's shock absorption
- Dirt and grime in the midsole cause the shoe to wear out sooner; therefore, the shoe needs to be cleaned with toothbrush, mild soap and water.
- Exposure to extreme heat and/or temperatures (i.e. Iraq or in your car during a hot Kentucky summer) accelerates shoe breakdown, so in Iraq you need to replace shoe before 6-9 months due to exposure to extreme elements.
- The midsole will last between 400-600 mils or 6-9 months with good care and typical North America temperatures.

Heel counter:

The heel counter prevents rotation of the heel in the shoes which can result in lower extremity injuries**.**

Basic Care

The heel counter will wear down if stepping on the back of the shoes or if leaving the shoes tied when removing them. The heel counter needs to remain stiff and/or rigid to be effective.

Outsole:

The outsole provides traction and stability, and structure to the shoe.

- Blown Rubber – light, not as durable
- Carbon Rubber – heavier, durable
- Combination – most shoes blown rubber in forefoot, carbon in rearfoot

Basic Care

Keep clean with mild soap and water, scrub with old tooth brush. Remove rocks and mud. The midsole will break down more rapidly if exposed to extreme heat such as the dryer or when deployed in countries such as Iraq.

Sockliner:

- A removal and disposable liner that sits just below the foot and helps provide a better fit for the foot.
- Includes the soft "tongue" of the shoe an elongated flap lying over the top of the foot under the laces to protect tendons, blood vessels from constrictions of the overlying laces.

Eyelets: The tiny holes the laces run through

Quarter Panel: The material that composes the sides of the shoe

Ankle Collar: Decreases friction on Achilles tendon

The "Last" Construction of a Running Shoe

Last: is the attachment of the upper portion to the sole of the shoe and the overall curvature of the sole (bottom) of the shoe

- Outerlast – bottom of shoe, and it's shape
- Inner last – inside floor of the shoe

Inner Last: (remove the insole's orthotic portion to see the shoe's last)

- Board – more stability and rigidity than slip last. Good for flat feet
- Slip –most flexible. Good for high arch feet
- Combination – stable and stiff in the heel, flexible in the forefoot

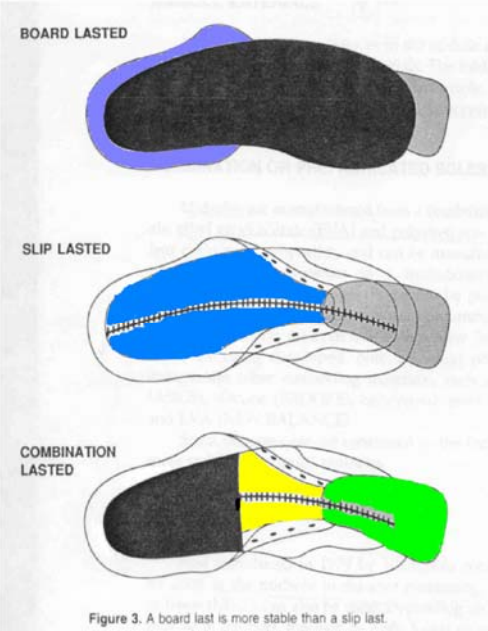


Figure 3. A board last is more stable than a slip last.

Three Shapes of the Outerlast

(look at the bottom of your shoe)

- **Straight:** No curvature from heel to toe, recommended for runners with flat feet or overpronators
- **Curved:** 8% of curvature from heel to toe, recommended for runners with high or rigid feet
- **Semi- curved:** the last curvature is reduced in comparison to the curved last between heel to toe. Recommended for runners with normal arches and gait mechanics.

Type of Arch		High 	Average 	Low 
Outer Last		Curved 	Semi-curved 	Straight 

See **Appendix C** for running shoe guide handouts for your Soldiers and **Appendix D** for lacing techniques.

Running Shoe Purchasing Tips

1. Choose from among true **Training** running shoes **NOT** racing shoes.
2. Try on shoes in the afternoon when feet are the largest. Also when you run, your feet tend to spread out slightly as well.
3. If have you inserts or orthotics be mindful will need a larger shoe and will need to remove the shoe's sock liner.
4. You should never need to "break in" proper fitting running shoes, designed for your foot type.
5. GO to a running shoe store, not just an athlete store. Local stores that allow you to run in your shoes prior to purchase and do gait analysis are Fleet Feet in Brentwood, TN (outside Nashville, TN) or more locally R3 in Clarksville, TN.
6. The best shoe is not always the most expensive, most stylish or popular shoe. In fact, shoe price is **poor** predictor for risk of running injuries.
7. Average running shoes prices are between $70-100, it is unlikely you will be able to purchase an adequate shoe in the $20-40 price range.
8. To ensure proper fit and comfort consider the following guidelines
    - Wear the same socks you wear when you run
    - Allow approximately ½" between the end of your longest toe and the tip of the shoe, as well as ½" between the top of your highest toe and the upper part of the shoe (need to be able to wiggle toes without restriction)
    - Ensure the widest portion of your feet match the widest portion of the shoe.
    - Walk and run in the shoe on a hard surface (ask to run outside or on a treadmill)
    - The heel should be snug and not slip when you walk or run.
    - Place shoes on a flat counter to check for balance. In other words, they should rest flat and not tilt.

Running Shoe Stores and Websites

1. **R3 – Running, Racing, and Relaxing**
   Address: 2535 Madison St. Suite H
   Clarksville, TN 37043
   Phone: 931-233-1808
   Email address: Mwimberly@Running-racing-relaxing.com

2. **Fleet Feet**
   Address: 330 Franklin Rd, Suite 262-B
   Clarksville, TN 37027
   Phone: 615-373-1123
   Web address: www.fleetfeetnashville.com

3. **Athlete's House (at Belmont University)**
   Address: 1700 Portland Ave
   Nashville, TN
   Phone: 615-298-4495

4. **Team Nashville**
   Address: 2817 West End Ave.
   Nashville, TN
   Phone: 615 -321-5257

Websites to purchase running shoes

1. **www.holabirdsports.com**
2. **www.roadrunnersports.com**
3. **www.runningshoes.com**

Information about shoes on the web

1. **www.runnersworld.com**
2. **www.cs.amedd.army.mil/aegis**

For footplate and ink kits to determine foot types:

1. **http://www.aetrex.com/products/apex/fitting_and_evaluation.html**

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. DA3349 form 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 stresson 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 requiredto 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/permanent) back problems, profiling or medical boarding. Some back injuries are more severe than others so profile lengths will vary. 1 to 3 months is common.

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 baseline level of activity. Profile time frames do not include time spent on profile prior to initiating Physical or Occupational Therapy.

Injury	Treatment Time	Profiling
Neck and Back Muscle strain	2 - 3 weeks	No kevlar, ruck, lifting > 15 lbs, LCE, or flak vest; no sit-ups, leg lifts or flutter kicks; no repeated forward bending; no running, jumping, or marching; light duty. May need quarters for 24-48 hours
Ligament sprain	6-8 weeks	Same as muscle strain
Disc injury (HNP) or nerve root irritation	8 weeks or more	Same as muscle strain, plus no prolonged postures (sitting, standing); forward bending activities need to be completely avoided
Post-surgical back/neck	4-6 months (as prescribed by surgeon)	Activity usually limited to walk at own pace and distance for the first month, and then increased gradually
Shoulder Muscle strain	6-8 weeks	No upper body PT or overhead activities; no ruck, LCE, flak vest or weapons firing; no throwing (if on dominant side)
Tendonitis/bursitis	6-8 weeks	Same as muscle strain
Ligament sprain, muscle tear or shoulder separation	6- 8 weeks or longer depending on extent of injury	Same as a muscle strain; no lifting with injured arm; no running due to the jarring effect; may need sling 1-3 weeks
Shoulder dislocation	2-4 months	Same as ligament sprain; may be immobilized for 2-3 weeks, then use a sling for 1-2 more weeks

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.

Remember: warm up between 5 -10 minutes prior to initiation of the return to run program.

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

Return to FOOTMARCH Progression

Sample FOOT MARCH Progression

New, unfit or return from profile soldier:

Week	Weight / Gear	Distance (mi)
1	IBA no plates	2
2	IBA no plates	2.5
3	IBA no plates	3
4	IBA with plates	3
5	IBA with plates	4
6	IBA with plates and assault pack with 10 lbs	4
7	IBA with plates and assault pack with 10 lbs	5
8	IBA with plates and assault pack with 15 lbs	5
9	IBA with plates and assault pack with 15 lbs	6
10	IBA with plates and assault pack with 20 lbs	6
11	IBA with plates and assault pack with 20 lbs	7
12	IBA with plates and assault pack with 20 lbs	8
13	IBA with plates and assault pack with 20 lbs	9
14	IBA with plates and assault pack with 20 lbs	10
15	IBA with plates and assault pack with 20 lbs	11
16	IBA with plates and assault pack with 20 lbs	12

REFERENCE WEIGHTS:

- Medium IBA with all plates (no front-loaded items) and configured to MNCI standards: 42 lbs
- Air Assault Ruck: 27 lbs

Special Populations PT

Common Myths

Myth:
A soldier on a restrictive or "breathe at own pace and distance" profile is not a valuable or useful asset to the unit.
RESPONSE: A soldier on a restrictive profile often is capable and desiring to be useful to their unit. It is when the soldier perceives the unit no longer supports them, will their motivation to contribute in unit activities and return to full duty substantially decline.

Myth:
Soldiers on extended profiles are unmotivated and "tiny hearted".
RESPONSE: Often when a soldier has been on a profile greater than three months due to a musculoskeletal injury it is a result of chronic overuse injury or severe traumatic injury. These soldiers are often tired of dealing with the issue themselves and would like nothing better than to return to normal duty and get back into regular PT their unit.

Myth:
The best way to motivate a soldier off profile is to task them with undesirable duties for punishment and/or correction.
RESPONSE: Many times singling out a soldier consistently for menial tasks only serves to disengage them from unit comradely. In turn the soldier is not encouraged to be proactive in their recovery process, and assumes they are being punished for an injury they that may have acquired during unit training or combat.

Myth:
More is better. Many times IOT improve a soldier's APFT score and improve their physical fitness PT twice a day is mandated.
RESPONSE: Allowing adequate recovery time and varying the focus of each physical training session is essential to optimize performance and to promote healing in the musculoskeletal system. Running twice a day many times promotes further injury and compromises the soldier performance during regular unit PT and on their APFT. Refer to the running mileage and the risk – benefit charts when designing special population PT.

Myth:
If a soldier is unable to run during Unit PT because of their profile, they should be able walk during this time.
RESPONSE: Walking is often a good option for those soldiers who will be able to maximally participate in the activity without further aggravating their particular injury. However, often units have the soldier walk during the entire

PT time every day which will not adequately prepare the soldier to return to regular unit PT once they are off their profile.

Myth:
Permitting a soldier to workout in the gym during unit PT is a privilege that should not be afforded to those on profile.
RESPONSE: The gym can be an ideal location for the profiled soldier to maintain fitness standards without violating their profile. The gym also is a safe environment for the soldier to work on gradually progressing themselves back to regular unit PT.

Rationale for structured special populations PT

To *specifically assist* the soldier to return back to regular unit PT and duty with out causing further injury in time efficient manner.

To keep the injured soldier *physically fit* within the profile limitations IOT to expedite their RTFD and recovery process.

To *reduce overuse* temporary profiles

To prevent or substantially reduce *temporary profiles turning into permanent profiles*

To encourage an *environment of support* while a soldier is recovering from an injury

To *tailor profile PT* according the individual soldier's particular injury

To *encourage* the soldier in returning to full duty

To *provide accountability* during profile PT for all soldiers

To *develop confidence* in the soldier physical abilities in spite of their temporary limitations

Special Populations Idea Book

Below is an example 6 week menu for Special Populations PT following the principles addressed in this guide as well as the individual's profile. There are a total of 5 groups based on the type of injury and their particular physical limitation. Below is a table of the 5 groups with a brief description of each group.

GROUP	TYPES OF INJURIES	PROGRAM
LAKERS	**Lower body- NO IMPACT --**fracture, severe ligament sprain, severe low back pain	Dynamic stretching Core strengthening Non-impact aerobic exercises- swimming
PISTONS	**Lower body – SOME IMPACT-** knee, ankle, hip pain	Dynamic stretching Core strengthening Low-impact aerobic exercises- elliptical trainer /stat bike/ swimming
PACERS	**Lower body – self paced with some impact** – knee/ankle/hip (recovery or less severe)	Dynamic stretching Core strengthening Agility/plyometrics Low to moderate impact aerobic exercises
BUCKS	**Upper body injury**- fracture, tear of muscle or cartilage in shoulder, wrist, hand	Dynamic stretching (limited to LE only) Core strengthening Low impact aerobic exercises
WARRIORS	**Recovery phase of an injury**- Requires 2x length of profile up to 90 days	Dynamic stretching Core strengthening Progression to return to run/Ruck March/regular Unit PT

Basic Guidelines for Special Populations PT

Soldiers are always susceptible to injury. The following suggestions can help senior leaders 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
- Refer to Nutrition section for additional guidance

Soldiers who did not pass the APFT

- Focus on the event 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 --such as the STARS program.
Keep to the 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

LAKERS: Lower Body, NO Impact

6-Week Plan	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Dynamic warm-up Push strength Core strength	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Pull strength Core Strength	Dynamic warm-up Core strength Non-impact	Non-impact- Pool day
Week 2	Dynamic warm-up Pull strength Non-impact	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Push strength Non-Impact	Dynamic warm-up Core strength Non-impact	Non-impact- Pool day
Week 3	Dynamic warm-up Core strength Push strength	Dynamic warm-up Pull strength Non-Impact	Dynamic warm-up Core strength Push strength	Dynamic warm-up Core strength Non-Impact	Dynamic warm up Pull strength Non-impact
Week 4	Dynamic warm-up Push strength Core strength	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Pull strength Core strength	Dynamic warm-up Core strength Non-impact	Non-impact- Pool day
Week 5	Dynamic warm-up Core strength Push strength	Dynamic warm-up Push strength Non-impact	Dynamic warm-up Core strength Pull strength	Dynamic warm-up Core strength Non-impact	Dynamic warm up Push strength Non-Impact
Week 6	Dynamic warm-up Core strength Pull strength	Dynamic warm-up Core strength Non-Impact	Dynamic warm-up Pull strength Non-Impact	Dynamic warm-up Core strength Non-impact	Dynamic warm up Push strength Combatives ???

KEY
Warm-up/ Flexibility
Strength
Aerobic
Anaerobic

Speed and agility	High intensity run	Ability group run	Non-impact day (non run/march)
Combination of:	Choose One:	*20-35 minute duration*	Choose One:
Ladder drills	30/30	Choose One:	Swim
Cutting drills	Track intervals	Recovery	Bike
Short sprints	Short hills	Trail run (not in the dark)	Combatives
Plyometrics	Long hills		Grass drills
Medicine ball drills	Fartlek		
Kettle ball	Tempo		
Push strength	**Pull strength**	**Core strength**	**Footmarch**
Choose 2 upper & 2 lower:	Choose 2 upper & 2 lower	Combination of:	Add no > than 1/2 mile per march
Bench press	Pull ups	Plank (any variations)	15-20 min per mile
Push ups	Sit ups (follow with cobra)	Star push up	Up to 55 lbs
Overhead press	Lat pull down	Crunches	Wear boots
Tricep extensions	Seated row	Reverse pike	
Leg press	Hamstring curls	Back extension	
Squats	Cleans	Warrior pose	
Lunges	Curls	Pike push up	
		Swimmer kicks	
		V-ups	
		New 8 count push up	

PISTONS: Lower Body, SOME Impact

6-Week Plan	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Footmarch
	Push strength	Core strength	Pull strength	Core strength	
	Combatives	Low impact	Grass drills	Non-impact	
Week 2	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Footmarch
	Pull strength	Core strength	Push strength	Core strength	
	Swim day	Low-impact	Core strength- med balls	Grass drills	
Week 3	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Pull strength	Core strength	Pull strength	Push strength
	Push strength	Swim day	Low -impact	Low impact	Combatives
Week 4	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Swim day
	Pull strength	Core strength	Push strength	Core strength	
	Low Impact	Low Impact	Grass Drills	Low -impact	
Week 5	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Push strength	Core strength	Core strength	Push strength
	Grass drills	Low Impact	Push strength	Low impact	Low Impact
Week 6	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Core strength	Pull strength	Core strength	Grass drills
	Pull strength	Swim day	Core strength	Low Impact	Low Impact

KEY
Warm-up/ Flexibility
Strength
Aerobic
Anaerobic

Speed and agility	High intensity run	Ability group run	Non-impact day (non run/march)
Combination of:	Choose One:	*20-35 minute duration*	Choose One:
Ladder drills	30/30	Choose One:	Swim
Cutting drills	Track intervals	Recovery	Bike
Short sprints	Short hills	Trail run (not in the dark)	Combatives
Plyometrics	Long hills		Grass drills
Medicine ball drills	Fartlek		
Kettle ball	Tempo		

Push strength	Pull strength	Core strength	Footmarch
Choose 2 upper & 2 lower:	Choose 2 upper & 2 lower:	Combination of:	Add no > than 1/2 mile per march
Bench press	Pull ups	Plank (any variations)	15-20 min per mile
Push ups	Sit ups (follow with cobra)	Star push up	Up to 55 lbs
Overhead press	Lat pull down	Crunches	Wear boots
Tricep extensions	Seated row	Reverse pike	
Leg press	Hamstring curls	Back extension	
Squats	Cleans	Warrior pose	
Lunges	Curls	Pike push up	
		Swimmer kicks	
		V-ups	
		New 8 count push up	

PACERS: Lower Body, Self Paced with SOME Impact

6-Week Plan	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Footmarch
	Push strength	Core strength	Pull strength	Core strength	
	Speed and agility	Ability group run/Non-impact	Low Impact	Ability group run/Non Impact	
Week 2	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Footmarch
	Pull strength	Core strength	Push strength	Core strength	
	Combative	Low impact	Speed and agility	Ability group run/Non-impact	
Week 3	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Pull strength	Core strength	Core strength	Push strength
	Push strength	Speed and agility	Non-impact	Ability group run/Low -impact	Core strength
Week 4	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Footmarch
	Pull strength	Core strength	Push strength	Core strength	
	Ability group run/Low impac	Combatives	Speed and agility	Non-impact	
Week 5	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Push strength	Core strength	Core strength	Core strength
	Pull strength	Ability group run/ low impact	Push strength	Ability group run/Non-impact	Non-impact
Week 6	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Core strength	Pull strength	Core strength	Push strength
	Push strength	Ability group run/Low-impact	Speed and Agility	Low Impact	High intensity run run

KEY
Warm-up/ Flexibility
Strength
Aerobic
Anaerobic

Speed and agility	High intensity run	Ability group run	Non-impact day (non run/march)
Combination of:	Choose One:	*20-35 minute duration*	Choose One:
Ladder drills	30/30	Choose One:	Swim
Cutting drills	Track intervals	Recovery	Bike
Short sprints	Short hills	Trail run (not in the dark)	Combatives
Plyometrics	Long hills		Grass drills
Medicine ball drills	Fartlek		
Kettle ball	Tempo		
Push strength	**Pull strength**	**Core strength**	**Footmarch**
Choose 2 upper & 2 lower:	Choose 2 upper & 2 lower:	Combination of:	Add no > than 1/2 mile per march
Bench press	Pull ups	Plank (any variations)	15-20 min per mile
Push ups	Sit ups (follow with cobra)	Star push up	Up to 55 lbs
Overhead press	Lat pull down	Crunches	Wear boots
Tricep extensions	Seated row	Reverse pike	
Leg press	Hamstring curls	Back extension	
Squats	Cleans	Warrior pose	
Lunges	Curls	Pike push up	
		Swimmer kicks	
		V-ups	
		New 8 count push up	

BUCKS: Upper Body Injury

6-Week Plan	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Dynamic warm-up Push strength Low Impact	Dynamic warm-up Core strength Ability group run/Non-impact	Dynamic warm-up Pull strength Core Strength	Dynamic warm-up Core strength Non-impact	Low Impact
Week 2	Dynamic warm-up Pull strength Core strength	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Push strength Low impact	Dynamic warm-up Core strength Non-impact	Low Impact
Week 3	Dynamic warm-up Core strength Push strength	Dynamic warm-up Pull strength Low Impact	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Core strength Low impact	Dynamic warm up Push strength Low Impact
Week 4	Dynamic warm-up Pull strength Low impact	Dynamic warm-up Core strength Push strength	Dynamic warm-up Push strength Low Impact	Dynamic warm-up Core strength Non-impact	Non Impact
Week 5	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Push strength Low Impact	Dynamic warm-up Core strength Pull strength	Dynamic warm-up Core strength Low-impact	Dynamic warm up Push strength Core strength
Week 6	Dynamic warm-up Core strength Push strength	Dynamic warm-up Core strength Non-impact	Dynamic warm-up Pull strength Low Impact	Dynamic warm-up Core strength Low impact	Dynamic warm up Push strength Non-Impact

KEY
Warm-up/ Flexibility
Strength
Aerobic
Anaerobic

Speed and agility	High intensity run	Ability group run	Non-impact day (non run/march)
Combination of:	Choose One:	*20-35 minute duration*	Choose One:
Ladder drills	30/30	Choose One:	Swim
Cutting drills	Track intervals	Recovery	Bike
Short sprints	Short hills	Trail run (not in the dark)	Combatives
Plyometrics	Long hills		Grass drills
Medicine ball drills	Fartlek		
Kettle ball	Tempo		
Push strength	**Pull strength**	**Core strength**	**Footmarch**
Choose 2 upper & 2 lower:	Choose 2 upper & 2 lower:	Combination of:	Add no > than 1/2 mile per march
Bench press	Pull ups	Plank (any variations)	15-20 min per mile
Push ups	Sit ups (follow with cobra)	Star push up	Up to 55 lbs
Overhead press	Lat pull down	Crunches	Wear boots
Tricep extensions	Seated row	Reverse pike	
Leg press	Hamstring curls	Back extension	
Squats	Cleans	Warrior pose	
Lunges	Curls	Pike push up	
		Swimmer kicks	
		V-ups	
		New 8 count push up	

WARRIORS: Recovery Phase Prep for Returning to Duty

6-Week Plan	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Footmarch
	Push strength	Core strength	Pull strength	Core strength	
	Low impact	Speed and agility	High Intensity run	Non-impact	
Week 2	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Foot March
	Pull strength	Core strength	Push strength	Core strength	
	Low Impact	Non-impact	Core strength	Non-impact	
Week 3	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Pull strength	Core strength	Core strength	Push strength
	Push strength	High intensity run	Non-impact	Ability group run/Non-impact	High intensity run
Week 4	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Footmarch
	Pull strength	Core strength	Push strength	Core strength	
	Speed and Agility	Non-impact	High Intensity run	Non-impact	
Week 5	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Push strength	Core strength	Core strength	Push strength
	Non-impact	Speed and Agility	Non-Impact	Low impact	High Intensity run
Week 6	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm-up	Dynamic warm up
	Core strength	Core strength	Pull strength	Core strength	Push strength
	Push strength	Non-impact	High Intensity run	Non-impact	Speed Agility

KEY
Warm-up/ Flexibility
Strength
Aerobic
Anaerobic

Speed and agility	High intensity run	Ability group run	Non-impact day (non run/march)
Combination of:	Choose One:	*20-35 minute duration*	Choose One:
Ladder drills	30/30	Choose One:	Swim
Cutting drills	Track intervals	Recovery	Bike
Short sprints	Short hills	Trail run (not in the dark)	Combatives
Plyometrics	Long hills		Grass drills
Medicine ball drills	Fartlek		
Kettle ball	Tempo		

Push strength	Pull strength	Core strength	Footmarch
Choose 2 upper & 2 lower:	Choose 2 upper & 2 lower:	Combination of:	Add no > than 1/2 mile per march
Bench press	Pull ups	Plank (any variations)	15-20 min per mile
Push ups	Sit ups (follow with cobra)	Star push up	Up to 55 lbs
Overhead press	Lat pull down	Crunches	Wear boots
Tricep extensions	Seated row	Reverse pike	
Leg press	Hamstring curls	Back extension	
Squats	Cleans	Warrior pose	
Lunges	Curls	Pike push up	
		Swimmer kicks	
		V-ups	
		New 8 count push up	

Nutritional Guidelines

Staying physically fit and injury free are essential pieces of proper preparation for the battle ready Soldier. Proper fueling for training and healthy weight maintenance is also necessary to optimize the Soldier's training and combat performance. As tactical athletes, the Soldier's nutrition requirements vary as their physical demand in training and combat mission change.

Weight Management vs. Optimal Performance Guidelines

Proper diet can optimize the Soldier's training performance. When assessing nutritional requirements, it is important to remember that Soldiers are professional tactical athletes, and weight management is only one of several components to review when the goal is optimizing performance.

Other key aspects include the following variables:

- Physical training recovery
- Delay fatigue
- Prevent injuries from dehydration, low blood sugar, and muscle cramps
- Speed recovery
- Supplements

Fuel intake to match energy expenditure

- Maintain healthy weight
- Gain muscle mass
- Reduce body fat

IT'S ALL ABOUT BALANCE 

Fundamental Guidelines:

Most athletes follow a high carbohydrate, moderate/high protein and low fat diet.

→ Carbohydrates	45-65% of caloric intake
→ Protein	10-35% of caloric intake—select lean sources
→ Fat	20-35% of caloric intake

Remember nutritional needs vary as training and activity level changes!

Estimating Calorie Need

Activity Level	Male- Calories Needed	Female- Calories needed
Light	Weight in lbs x 17	Weight in lbs x 16
Moderate	Weight in lbs x 19	Weight in lbs x 17
Heavy	Weight in lbs x 23	Weight in lbs x 20

- **170lb Male light activity = 2,890 calories**
- **170lb Male heavy activity = 3,900 calories**
- **140lb Female light activity = 2,240 calories**
- **140lb Female heavy activities = 2,800 calories**

Weight Loss Tips And Facts

- **One pound = 3,500 calories**
- **Exercise alone usually does NOT lead to weight loss**
- **Watch fluid calories**
- **Moderation and tracking food/beverage intake are key tools – www.fitday.com or www.sparkpeople.com**

Weight Gain Tips And Facts

- One pound = 3,500 calories
- To gain one pound per week increase calorie intake by 500-1,000 calories per day
  - → Add an extra snack (PB & J with milk)
  - → Consume higher calorie foods (juice, lattes, deserts)
- Most Americans consume enough protein per day to meet the needs of a weightlifter
  - → Increase carbs to gain weight and muscle

Eating For High Demand Performance

Pre- Mission preparation (at the latest, 3-4hrs prior to mission)

- Large high carbohydrate meal
- Ex: Pasta with marinara sauce, toast, juice or regular soda

1 hour prior

- 100g carbs, moderate protein, low fat
- 16-32 oz of fluid
- Ex: 1 large bagel, 1 Tbsp Lt cream cheese, 16 ounces of juice

During

- 30-60 grams of carbs per hour
  - 2-4 cups of sports beverage
  - 1-3 energy gels or 6-12 charms
- 4-8 oz fluid every 15-20 minutes
  - Keep pace with sweat rate/perspiration

Post -Mission/ Recovery

- Hydration
- A pint (2 cups) per pound
- Sports drinks, juice, milk, meal replacement drink

Replenish Glycogen (carbohydrate stores)

- First 60-90 min post exercise is key
- 4:1 Carbohydrate to protein ratio within the first hour
- Ex: Pasta w meat sauce, peanut butter with bread and a banana

MRE: Nutritional Facts

Total	1 MRE	2 MREs	3 MREs	%s
Calories	**1,312**	**2,624**	**3,936**	**% of calories**
Protein	44g	88g	132g	13%
Carbs	175g	350g	525g	53%
Fat	50g	100g	150g	35%

MRE Meals

Spaghetti w/Meat Sauce =350 cal

Grilled Chicken Breast =130 cal

Item (g protein)	Calories
Crackers (4 g)	172
Wheat Snack Bread (3.5g)	186
Cheese Spread (5.5 g)	171
Peanut Butter (12.6 g)	258
Pound Cake (3.5 g)	280
Cookie (3 g)	275
Fig Bar (2.5 g)	190

Hydration Requirements

- The best indicator of salt/ water replacement needs after a workout is weighing oneself each day in the morning and the again after physical training. Any weight decrease is probably due to water loss, whereas any weight gain can be contributed to drinking too much water.
- The longer your workout or training lasts the more critical hydration becomes.
- Cold drinks are absorbed faster than warm drinks when exercise intensity exceeds 65-70% VO_2 Max.
- Losing more than 2 or more percent of your body weight due to sweating decreases blood volume. Low blood volume places a greater demand on your heart, which can decrease your performance.
- Drinking too much water during long endurance event can lead to complications such as hyponatremia (your body's chemical balance is diluted, and this can lead to **death**) if fluids are not replenished properly with a balance of sodium and carbohydrate. You can achieve a better balance with sports drinks and using energy gels/ charms.
- Too little water leads to dehydration.

Symptoms of Dehydration

- Extreme thirst (in fact, if you're thirsty, dehydration has already begun)
- Muscle weakness
- Headache
- Light headedness/ Dizziness
- Dry sticky mouth

Hydrating for High Demand Performance

Pre Mission

- In days prior to the mission, increase sodium (salt) intake moderately, most individuals already meet this requirement in their normal diet.
    - Exception: Those with high blood pressure
- Two hours prior to the event, drink a minimum of 2 cups of water.

During Mission

- Do not drink more than you sweat. Remember to weigh yourself before and after exercise in the environment you will be performing missions (temperature and altitude) to determine the right amount of hydration you require.

- Drinking sports drinks with sodium is especially important during missions or training sessions lasting greater than 60 minutes. If under 60 minutes, water is the ideal beverage for hydration.
- During a mission or training event lasting greater than 60 minutes, make an effort to drink 1 cup of fluid every 15-20 minutes.

Post Mission/Recovery

- For each 1 lb loss of body weight replace with 16 oz of fluid
- Drink cool beverages
- For strenuous missions longer than 60 min, drink beverages with electrolytes included such as energy or sports drink.

Anti-inflammatory Medication and Performance

- It is best to wait until after a strenuous mission (especially if you can expect to be sweating heavily) to take Motrin, Naproxen, Mobic, Ibuprofen, and other nonsteroidal anti-inflammatory medications (NSAIDs).

- This is important because these drugs can put athletes at risk for hyponatremia (diluted body chemicals), damage the kidneys, or result in gastric bleeding, all of which are medical emergencies.

- If waiting until after the mission to take your medicine will result in too much pain and you must take the medication before the mission, make sure you are getting plenty of salt in your diet and you are including sports drink in your hydration routine- not just water – during the mission.

High Altitude Acclimatization

Soldiers need to be able to acclimatize to various climates across the globe from extreme heat to extreme cold and extreme changes in altitude. If not properly prepared, a Soldier can quickly suffer severe and debilitating effects.

Hypoxia (low blood oxygen) is the primary negative effect altitude has on the body. Hypoxia, if not properly addressed, can lead to "Acute Mountain Sickness" aka AMS or altitude sickness. This occurs with rapid ascension into a high altitude environment (greater than 8,000 ft above sea level).

Signs and symptoms of AMS include the following:

- Severe headache
- Nausea
- Gastrointestinal disturbances (upset stomach)
- Insomnia

These symptoms typically emerge 6 to 12 hrs after reaching an altitude of 8,000 ft (or lower depending on physical condition) and will resolve within 3 to 7 days. Less common, however, more serious complications of high altitude are high-altitude pulmonary edema (lung tissue swelling) AKA HAPE and high-altitude cerebral edema (brain swelling) AKA HACE.

The best preventive methods are simply gradual ascent by overnight stops at intermediate altitudes and when going higher than 8,000ft above sea level avoiding vigorous exercise for the first 2-3days after arrival.

Common Physiological Changes

- Increased pulmonary ventilization (breathing harder), especially during exercise, will create the sensation of "breathlessness." This will actually become more pronounced after several days of living in the environment.
- Reduction in oxygen levels in the bloodstream places greater demand on the cardiovascular system. This results in an increased heart rate to sustain the same level of oxygen in the blood that is achievable at lower heart rates at sea level.
- The greatest cardiovascular effect during exercise is a decreased work capacity and endurance, which are evident at 5,000 ft above sea level (or lower with individuals who are less physically fit).
- It will take an average of 5-10 days to acclimate to the high altitude

Heat Acclimatization

- Heat acclimatization:
  - Improves tolerance to higher temperatures
  - Reduces risk for heat related illness/injury
  - Improves endurance for exercising in the heat
  - Lowers heart rate and body temperature at a given exercise intensity
  - Increases sweating rate and amount (better cooling)
  - Results in more diluted sweat

- How do we do heat acclimatization?
  - Exercise in the heat of the day at Ft. Campbell prior to deployment, gradually increasing the time and intensity of exercise each day.
  - On average it will take between 10-14 days to fully acclimatize to the heat, although illness or alcohol consumption may slow this process.

- Delays in acclimatization occur in the overweight, Soldiers taking certain medications for cardiovascular disease, Soldiers with diabetes, and Soldiers with hypertension. All of these result because of a decreased ability to dissipate heat.

Resource Guide to Fitness Facilities

Gym	Clarksville Base Physical Fitness Center	E-Step Wellness Center	Olive Physical Fitness Center	Gertsch Physical Fitness Center	Fratellenico Physical Fitness Center	Lozada Physical Fitness Center	Freedom Fighter Physical Fitness Center
Phone #	270-798-6006	270-798-4664	270-798-4101	270-798-2753	270-798-9418	270-798-4306	270-798-7355
Location	7540 Headquarters Loop	2270 14th & Kentucky	6990 Ashau Valley	3610 50th Street & Indiana	3932 Indiana Avenue	6992 Desert Storm	7037 Lifeliner Dr
Hours	**OPEN** Mon- Fri 0600-1400 **CLOSED** Weekends, DONSAs, holidays	**OPEN** Mon-Fri 0500-2100 Sat 0700-1800 Sun 1000-1800 Holidays/DONSA: 0700-1800	**OPEN** Mon-Th 0530-2000 Fri 0530-1800 Sun 0900-1700 Holidays/DONSA: 0900-1700 **CLOSED** Saturday	**OPEN** Mon-Th 0500-2000 Fri 0500-1800 Sat/Sun 0800-1600 Holidays/DONSA: 0900-1700	**OPEN** Mon-Th 0530-2000 Fri 0530-1800 Sat 0900-1700 Holidays/DONSA: 0900-1700 **CLOSED** Sunday	**OPEN** Mon-Th 0530-2000 Fri 0530-1800hrs Sat 0900-1700hrs Holidays/DONSA: 0900-1700 **CLOSED** Sunday	**OPEN** Mon-Fri 0530-2100 Sat 0900-1700 Holidays/DONSA 0900-1700hrs **CLOSED** Sunday
Treadmills	3	9	8	10	15	5	11
Ellipticals	7	9	12	11	16	10	12
Stationary Bikes	3 recumbent 5 upright	6 recumbent 5 upright	3 recumbent 4 upright	10 upright 4 recumbent	6 upright 4 recumbent	6 upright 4 recumbent	9 upright 9 recumbent
Stairmasters	3	2	5	10	5	4	4
Rowing machine	0	0	0	1	0	0	0
Versa Climber	0	2	2	0	0	0	0
Services	Punching bag, aerobic and weight rooms. Fitness evaluations.	Punching bag, aerobic and weight rooms. Fitness evaluation.	Punching bag, aerobic and weight rooms. Fitness evaluation.	Punching bag, aerobic and weight rooms. Fitness evaluation.	Punching bag, aerobic and weight rooms. Fitness evaluation.	Punching bag, aerobic and weight rooms. Fitness evaluation.	Punching bag, aerobic and weight rooms. Fitness evaluation.

Equipment Resources

Running Shoes:

Websites:

1. Purchasing shoes on the web: www.holabirdsports.com; www.roadrunnersports.com; www.runningshoes.com
2. Information about shoes on the web: www.runnersworld.com; www.cs.amedd.army.mil/aegis; www.benning.army.mil/usapfs

Reliable Running Shoe Stores:

1. Clarksville area: R3 – Running, Racing, Relaxing
2. Nashville area: Athlete's House, Fleet Feet, Team Nashville

Footplates for determining foot type:

1. http://www.aetrex.com/products/apex/fitting_and_evaluation.html

Equipment Sources:

Tubing: Quick Series – contact geraldb@quickseries.com

Bikes:

1. LeMond Revmaster bikes:
   - http://www.lemondfitness.com/products_info.php?id=5
2. Monarch bikes:
   - http://www.fitnessgiant.com/monarch827.html

We recommend sticking with the ones that are not computer operated because we're not sure how they will hold up in austere environments.

Bowflex:

- These will hold up fine in austere environments.
- http://www.bowflex.com

Plyo boxes, medicine balls, etc.

- www.performbetter.com

A variety of portable fitness guides that can be made to order with your unit insignia are available. Order forms are in **Appendix E.**

Hospital and Soldier Health Clinic Information

Blanchfield Army Community Hospital - BACH

650 Joel Drive
Ft. Campbell, KY 4222

Physical Therapy Clinic
270- 798-8102

Occupational Therapy Clinic
270-798-8085

Orthopedic Clinic
270-798-8375

Radiology Clinic
270-798-8333

Physical Medicine and Rehabilitation (Pain Clinic)
270-798-8166

LaPointe Health Clinic - LHC

Physical Therapy Clinic
270-956-0306

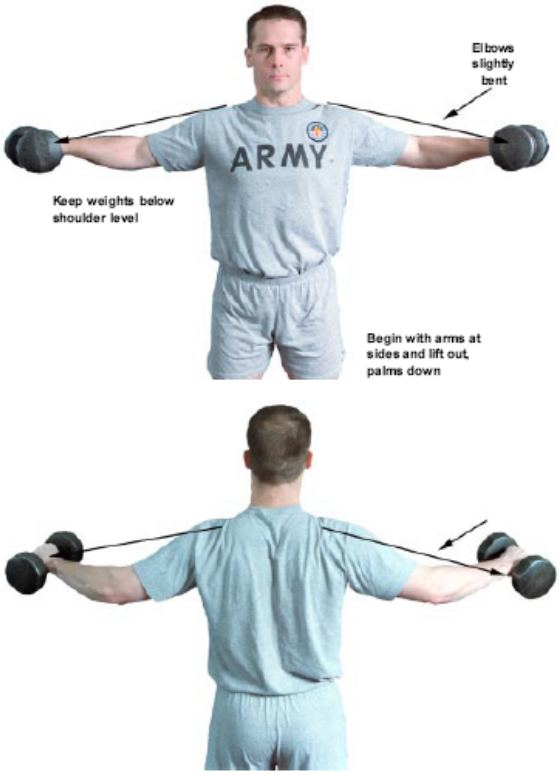
Chiropractic Clinic
270-956-0250

Appendix A: Proper Weight Lifting Form

Upper Body

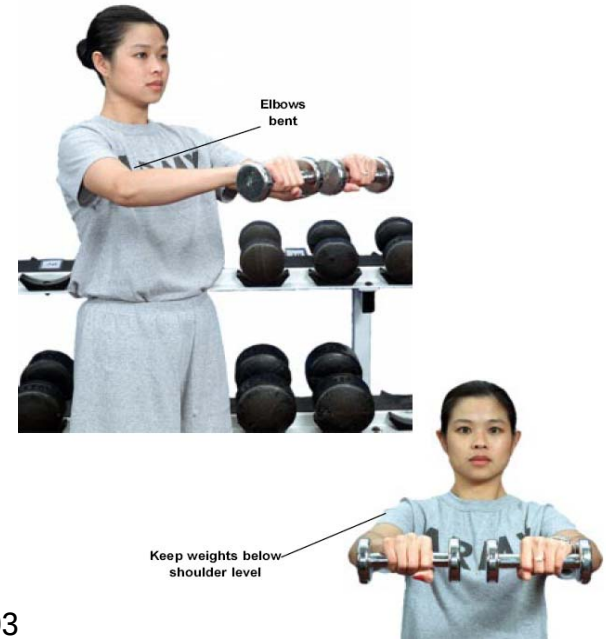
Overhead Press

Lateral Raises

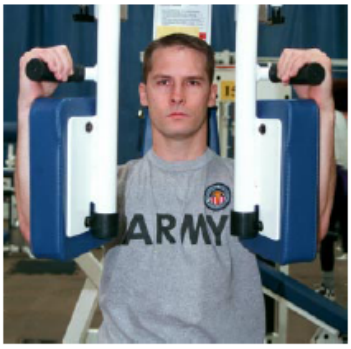


Upright Row

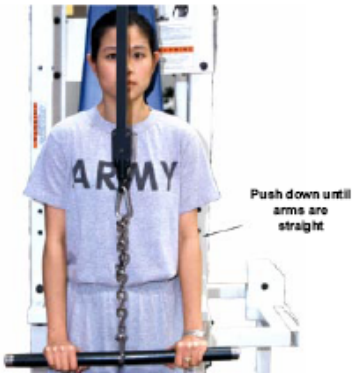
Frontal Raise



Fly Machine



Tricep Pushdown

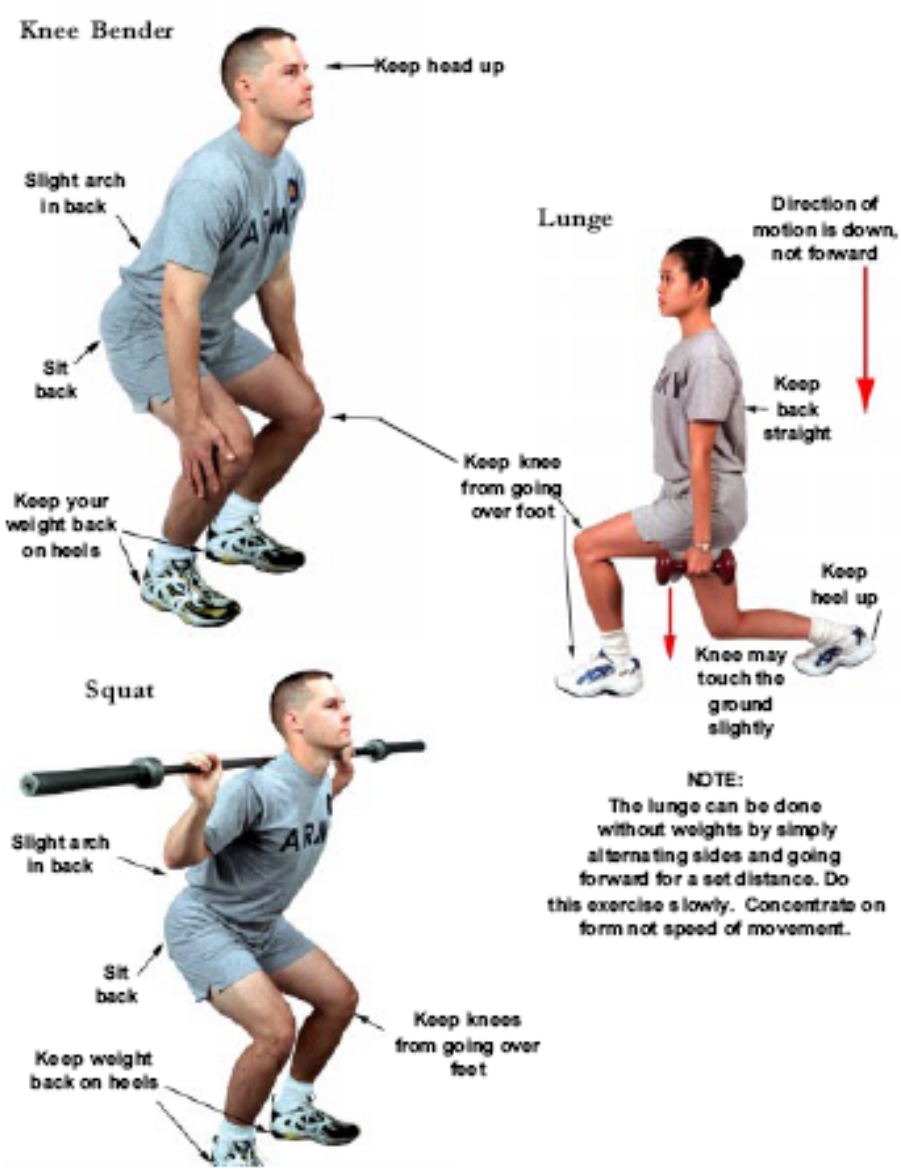


Lat Pull Down

Lat Pull Biceps

Bench Row

Lower Body


Knee Bender
Keep head up
Slight arch in back
Sit back
Keep your weight back on heels
Keep knee from going over foot
Lunge
Direction of motion is down, not forward
Keep back straight
Keep heel up
Knee may touch the ground slightly
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
Slight arch in back
Sit back
Keep knees from going over feet
Keep weight back on heels

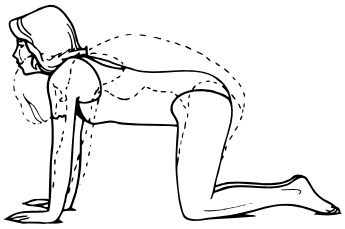
Appendix B: Exercise Handouts for Common Injuries

*__Important:__ Make your appointment with physical therapy or your primary care provider (likely your PA), and as you are waiting for you appointment, get started with these exercises.

Back Pain

Perform 10 reps, 2-3 sets. Do 2-3 sessions per day

Hand Heel Rock

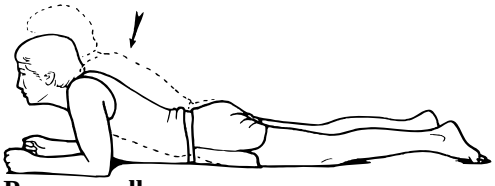


1) Tuck chin and tighten stomach while arching back.

2) Slide hands forward and buttocks back

3) Press upper body upward into position shown, keeping hips in contact with floor. Keep lower back and buttocks relaxed.

Hold each of the following stretches for 15-30 seconds
Perform 2-3 reps, 2-3 times a day

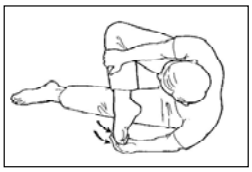


Prone on elbows
Raise up on elbows as high as possible, keeping hips on floor and relaxing back.

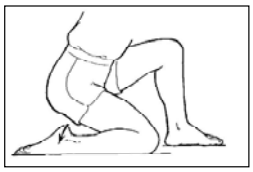
Standing Backward bend
Arch backward to make hollow of back deeper.

Standing Hamstring Stretch
Place foot on stool, keeping back straight, bend at the hips & reach toward your foot.

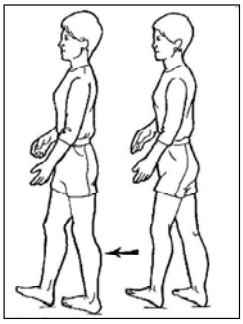
Shin Splints



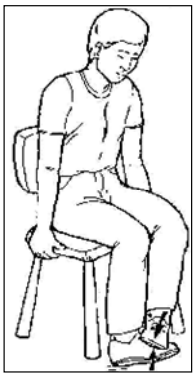
1. Assume the position shown.
2. Pull the toes toward your body so that you feel a stretch.
3. Hold 30 seconds.
4. Perform 3 repetitions, 2 or 3 times per day.
5. Also perform before AND after running.



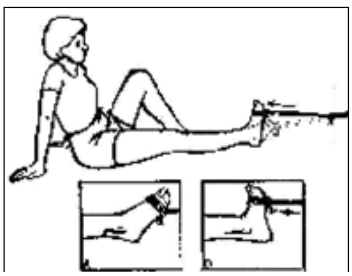
1. Assume the position shown.
2. Lean your bodyweight downward so that you feel a stretch.
3. Hold 30 seconds.
4. Perform 3 repetitions, 2 or 3 times per day.
5. Also perform before AND after running.



1. Walk on heels with toes raised up off the floor.
2. Perform 3 sets, 2 or 3 times per day.



1. Sitting in a chair, place one foot on top of the other foot.
2. Pull the bottom foot up against the top foot.
3. Make sure all of the motion comes from the ankle joint.
4. Hold 5-10 seconds.
5. Perform 3 sets of 10-15 repetitions, 2-3 times per day.

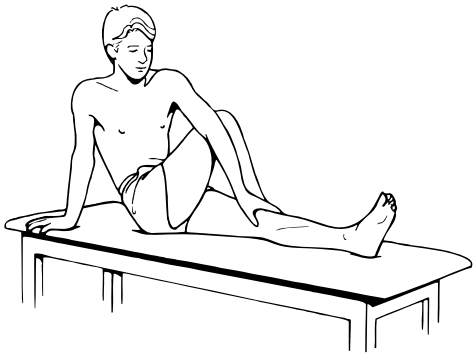


1. Tie one end of rubber tubing to a solid object such as a table leg.
2. Put the other end around the foot as shown.
3. Pull the foot up toward yourself slowly.
4. Hold 3-5 seconds.
5. Perform 3 sets of 10-15 repetitions, 2-3 times per day.

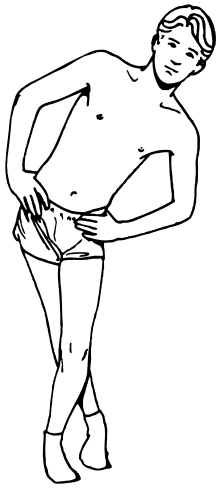
Lateral Knee Pain

Perform 2-3 reps. Do 2-3 sessions per day.
Hold 30 seconds.

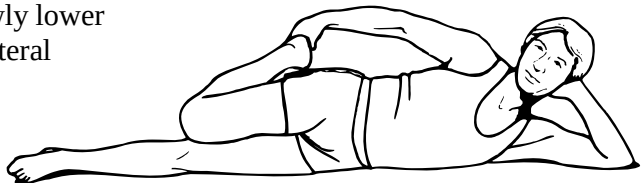
LATERAL HIP/BUTTOCK STRETCH
Cross leg over opposite thigh and place elbow over outside of knee. Gently stretch buttock muscles by pushing bent knee across body.



TENSOR STRETCH
Cross opposite leg over the affected leg. Place weight on affected leg, then lean to the opposite side until a stretch is felt over the outside of the affected hip. If unable to feel stretch, push pelvis toward the affected side.

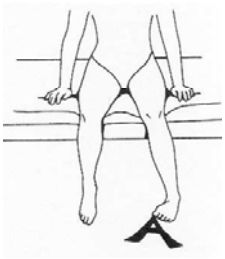


TFL/ ITB STRETCH
Lying on side, bring heel towards buttocks. Then bring knee first towards chest and then around toward outside of the body. Slowly lower the knee towards the ground until stretch is felt in the lateral thigh and IT band. If greater stretch is felt in the front of the thigh, let the leg drop slightly forward then down toward the ground.



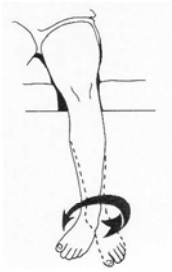
Ankle Sprain Initial Management

Ankle Alphabet



Using only the foot and ankle, trace the letters of the alphabet slowly. Perform 2-3 times per day.

Ankle Circles



Slowly rotate only the foot and ankle clockwise and then again counter clock wise. Perform for 30-45 seconds and then relax. Perform 2-3 times per day.

Ankle Pump

With involved leg elevated, slowly pump the ankle up and down. Perform 30-45 seconds and then relax. Perform 2-3 times per day.

Gastroc Towel Stretches

With towel wrapped around the top of the foot, pull towards body and hold for 30 seconds. Perform 3-5 times, 2-3 times per day.

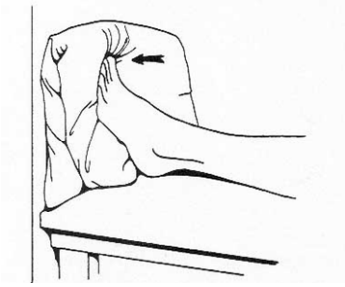
Soleus Towel Stretches

With knee slightly bent and towel wrapped around the top of foot, slowly pull towards body and hold for 30 seconds. Perform 3-5 times, 2-3 times per day.

Isometric Dorsiflexion

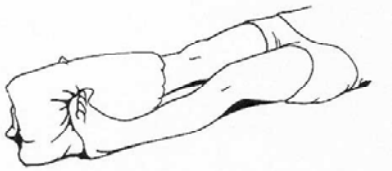
With involved ankle below pillow, slowly squeeze feet together. Hold for 5 seconds and relax. Perform 3 sets of 15 reps, 2-3 times per day.

Isometric Plantar Flexion



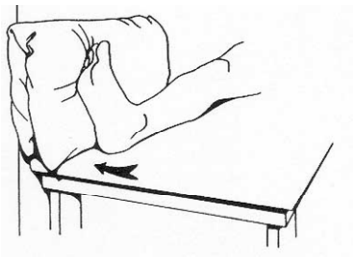
With pillow against wall, press foot into pillow. Hold for 5 seconds and relax. Perform 3 sets of 15 reps 2-3 times per day.

Isometric Inversion



With pillow between feet, press involved ankle into pillow. Hold for 5 seconds and relax. Perform 3 sets of 15 reps, 2-3 times per day.

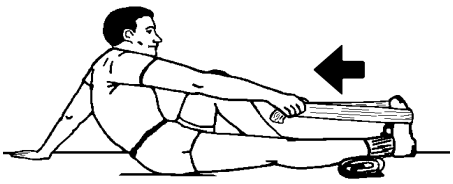
Isometric Eversion



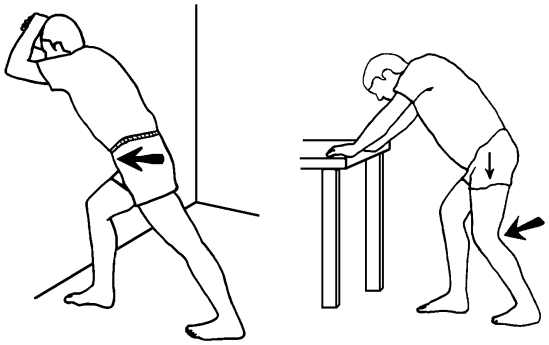
With pillow against wall, press involved ankle into pillow. Hold for 5 seconds and relax. Perform 3 sets of 15 reps, 2-3 times per day.

Heel Pain (Plantar Fasciitis)

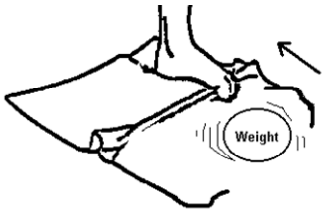
1. TOWEL STRETCH:
Position: Laying down. Loop a towel, belt over the forefoot.
Exercise: Pull the foot back until you feel a stretch at the calf.
Hold the stretch for 20-30 seconds, relax briefly and repeat x 5.



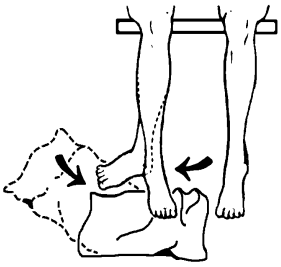
2. ACHILLES AND SOLEUS CALF STRETCH:
Position: Standing, lean into a wall or heavy table, foot aligned straight forward.
Exercise: Keep the heel flat on the floor. Lock the knee straight and move the hips forward until you feel a stretch in your ankle or the back of your leg. Repeat with knee partly flexed.



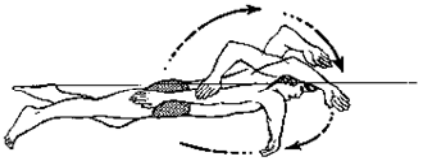
3. TOE CURLS:
Position: Sitting.
Exercise: Bunch up a towel as you curl your toes.
Place a weight on the towel to add resistance as you progress.
Perform 3 sets of 10 repetitions 2-3 times each day.

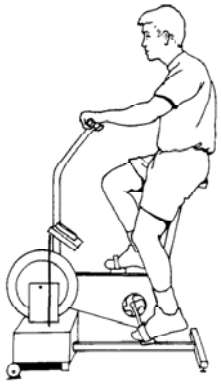


4. TOWEL SLIDES:
Position: Sitting, with the heel on the floor and forefoot on the towel.
Exercise A: Slide the towel to the outside, Move only your ankle and foot.
Exercise B: Slide the towel to the inside, Move only your ankle and foot.
Place a weight on the towel to add resistance as you progress.
Perform 3 sets of 10 repetitions 2-3 times each day.



5. ALTERNATIVE AEROBICS:
Avoid excessive walking and lower leg work outs during the first 3-5 days after an ankle sprain.
Three to five days after an ankle sprain, generally, you may begin light aerobic activities with ankle wrapped that are low impact and low weight bearing. Excellent early activities include swimming and biking. As your ankle swelling and pain resolves, Cross Country ski machines, stair stepping machines and glider type machines are also good choices.



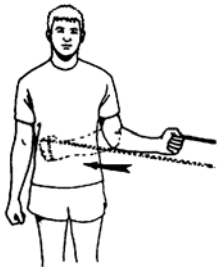


Shoulder Pain

Directions: Perform 3 sets of **10** repetitions of each exercise. Hold each repetition **5** seconds. Repeat exercise session 1 time per day. Exercises should not be painful.

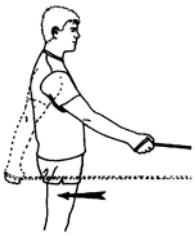
1. External Rotation
(hold pillow between elbow and body)

2. Internal Rotation



3. Flexion

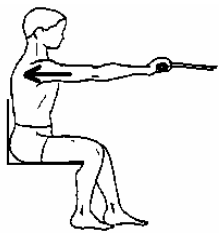
4. Extension



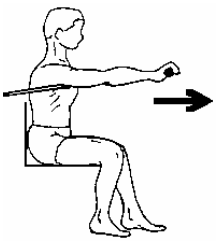
5. Abduction

6. Adduction

7. Scapular Rowing



8. Scapular Punching



Appendix C: Running Shoe Handout

U.S. Army-Baylor University
Doctoral Program in Physical Therapy
Army Medical Department Center & School
Fort Sam Houston, TX 78234

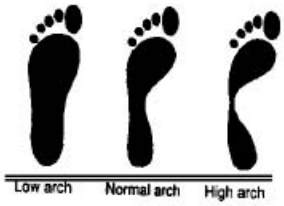
SELECTING THE RIGHT RUNNING SHOE

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 importance of proper footwear is to help counteract stresses placed on muscles, tendons, and bones, and thereby reduce the risk of injury. The proper running shoe can also make running more enjoyable and let you get more mileage out of your shoes. Runners should have a basic knowledge of shoe and personal foot anatomy to assist in the selection of their running shoes. Because everyone's foot is different there is not a perfect running shoe for everyone. To help ensure you get the right shoe for you - please follow this simple 4-step procedure.

STEP #1: KNOW YOUR FEET

GOAL: Determine which type of foot you have: low arch, normal arch or high arch

A. **Wet Test**. Wet your bare feet. Step on and off a piece of paper. Match your imprints to the ones below.



B. **Shoe Tests.** Take a moment to look at your current shoes

Test/Procedure & examples of a normal arch/wear pattern	Most likely a floppy foot (low arch, flat-feet, over pronator) if:	Most likely a rigid foot (high-arch, supinator) if:
Heel Counter Test: Place shoes on a flat surface and look at them from the rear 	Shoes (heel counter) tilt inward. The inward surface is more worn. 	Shoes (heel counter) tilt outward. The outer surface is more worn. 
Tread Test*: Look at the soles of the shoes 	Extreme wear on the inside of the shoe sole 	Extreme wear on the outside of shoe sole 

* Darkened areas demonstrate wear patterns

C. **Squat Test:** Look in the mirror and bend your knees halfway. If the kneecaps rotate inward toward the medial arch (big toe) then your feet probably overpronate. If they rotate out toward the little toe, then your feet probably supinate (under pronate).

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STEP #2: KNOW YOUR SHOES

A. **First, learn the parts of the shoe**

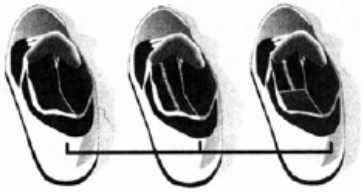
UPPER: Made of real or synthetic leather, with mesh that allows the shoe to "breathe."

MIDSOLE: The heart of a running shoe; a thicker layer of plastic foam (EVA) or polyurethane embedded with various shock-absorbing and supportive materials and devices (air/gel/etc).

OUTSOLE: Where the rubber meets the road. Durable carbon rubber is often used on high-abrasion areas like the heel. Softer blown rubber is often used on the rest of the outsole. Various textures and grid patterns provide traction, along with distinctive footprints.

TONGUE: Padded for comfort and to prevent rubbing on the top of the foot from the laces. Some tongues are now split to allow for foot expansion. A good tongue helps the shoe feel like a snug sock.

LAST: To determine the type of last used in a shoe, peer under the insole. There are typically three types



Board Last – The upper is fastened to a fiber board inside the shoe. That makes for a fairly stiff, stable shoe, good for runners with a low arch.

Slip Last – The upper is stitched in one piece around the last, then the last is slipped out. That makes for a very flexible shoe, good for runners who have high arches or runners with a neutral gait (walking or running pattern). The edges of the upper and midsole are sewn together like a moccasin.

Combination Last – Has a board last in the heel for stability and a slip last in the front for flexibility.

TOE BOX: Should be wide enough to let you wiggle your toes and long enough so that you have a half to full thumbnail's width between the end of your longest toe and the end of the shoe. A good toe box can help prevent blisters and black toe nails.

HEEL COUNTER: Cups the heel and helps keep the shoe stable. Usually topped by the Achilles notch, a V-shaped cutout that prevents the heel counter from chafing the Achilles tendon during running

INSOLE: Also called the sockliner. Made of a plastic foam that provides some shock absorption and arch support. The insole should be removable so that it may be cleaned or replaced with a thicker insert (i.e. sorbathane) or a custom-made orthosis (orthotic device).

LACES: Some shoes provide extra eyelets so they can be laced up in several patterns to accommodate feet of different widths and shapes.

REFLECTIVE TRIM: Great safety device – it is essential for dusk and nighttime running.

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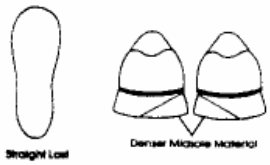
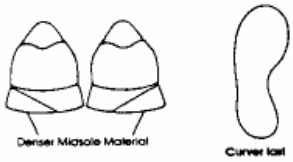
B. **Then match your foot type with the proper shoe type**

	Floppy Foot (overpronator, flat feet)	Normal Foot	Rigid Foot (supinator, high arch)
Description			
Foot Attributes	Foot strikes on the outer edge of the heel, then rolls inward excessively (over pronates).	Foot strikes on outer edge of the heel, then rolls inward (pronates) slightly to absorb shock. The foot then rotates outward (supinates) before toe off	Rigid feet do not roll inward sufficiently to adapt to the ground. Feet are less mobile, so more stress/force is applied to your body.
Typical Injuries	Soft tissue injuries Knee or shin pain Inner (medial) leg and foot pain Plantar fasciitis	Minimal for runners with normal arch, normal weight, and a good training program	Stress fractures (bone) Ankle injuries-sprains Outer (lateral) leg and foot pain Plantar fasciitis
Best Shoe	MOTION CONTROL SHOES Straight or semicurved last Firm midsole (dual density midsole with firmer surface on the inside) Board/combination last Firm heel counter Firm arch support 	STABILITY SHOES Semicurved last Dual density midsole Combination or semi-curved last	CUSHIONED SHOES Curved last Dual density midosle with the firmer denser portion on the outer edge Flexible sole Slip or combination last Total contact sock liner 
Avoid	Highly cushioned curved-lasted shoes that lack stability and control & poor training regimens	Poor training regimens	Motion-control shoes which reduce foot mobility & poor training regimens
Examples	Asics Gel Foundation Brooks Addiction Brooks Beast Mizuno Wave Renegade Nike Air Cesium Saucony Grid Stabil	Asics Gel 2120 Brooks Adrenaline Mizuno Wave Alchemy New Balance 767 Nike Air Structure Triax Saucony Grid Omni	Asics Gel Cumulus Brooks Glycerin Brooks Radius Mizuno Waver Rider Nike Air Pegasus Saucony Grid Triumph

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STEP #3: TIPS ON SHOE QUALITY AND SELECTION

A. **When should I try on shoes?** The key here is that feet swell during the day. If you only run in the morning - purchase shoes in the morning. If you work-out at different times of the day - purchase shoes in the afternoon when your feet are larger.

B. **How do I know the shoe I am looking at is a good quality shoe?**

Heel Counter View Test (see picture below)	Place the shoe on a flat surface and view them from the rear. The sole should lie flat and the heel counter should not tilt
Squeeze Test	Squeeze the heel counter. A firm heel counter should not collapse while you squeeze. Remember - it should be stiff enough to prevent your foot from rolling.
Bend Test (see picture below)	Hold the heel in one hand and the other hand at the toe box. Lightly bend the shoe. It should bend where your foot bends (at the balls of your feet). It should NOT bend elsewhere (i.e. in the middle of the shoe).
Inspection	Look for defects, feel the seams inside the shoe (they should be smooth, even, and well-stitched), check for loose threads or extra glue spots. Also the tongue should be well padded to protect your foot from the laces.

* Note: Running shoes are specifically engineered for running, whereas basketball, aerobic, or cross-trainers are not. Likewise, running shoes are not designed to provide stability during lateral, side to side or cutting movements during court sports.

Heel Counter View Test

Bend Test

C. **How can you tell if the fit is right?**

- You can trace your foot on a sheet of paper, then take the sockliner out of the shoe and trace that over your drawing of your foot – the 2 drawings should match in shape and size.
- Try on shoes with the socks that you normally wear while exercising.
- Try on shoes with your arch supports or orthotics if you typically wear them when exercising.
- Try on both shoes: many of us have one foot which is longer or wider than the other.
- To check if the shoes fits - stand up (don't sit) while you check the length and width of each shoe.
- Check the length- the distance from your longest toe to the end of the shoe should be not less than one half the width of your thumbnail, nor more than the entire width of the thumbnail.

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- Check the width - if the upper (nylon portion) of the shoe is bulging over the sides of the sole – the shoe is too narrow. The shoe is too wide if there is more than half a finger's width between the side of your foot (at the ball of your feet) and the side of the shoe.
- The heel should be snug. Raise up on your toes - your heel should not rise out of the shoe. Also, the heel counter of the shoe should not irritate or rub your heel.
- Every shoe style is made slightly different. Your size may change with both the style of a running shoe and/or the company that made it. If you are questioning if the size is right - always try on the next ½ size larger or smaller.
- The shoes should feel comfortable – they will not become more comfortable over time.
- Try running in the shoes before purchasing.
- Try on more than one model or brand of running shoe.

D. **I am on a tight budget what can I do?** You should set realistic expectations. Most good running shoes range from $60 upwards. You should expect to pay approximately $70-90. Pay too little for a shoe and you probably will not get the quality you need; pay too much and you may be paying for a glossy national ad campaign or features you do not need. Even though shoes are expensive, you can make your shoes last longer by only wearing them for running! Do not wear them to the grocery store, when cutting the grass, or walking the dog. Every mile you wear the shoe is one less mile they will provide you with the proper support. Search for the best price once you're satisfied with a specific brand and style of shoe. Consider purchasing last year's shoe model, using outlet vendors, or searching the internet for the best price.

E. **If you need more help selecting a running shoe,** seek out your physical therapist or a knowledgeable sales person and ask for advice. You should bring an old pair of running shoes and wear shorts for him or her to evaluate your old shoes and your biomechanics. A good source on the internet is: www.runnerworld.com/shoes/.

STEP #4: KNOW WHEN TO BUY NEW SHOES!

The average running shoe should last between 400-600 miles (about 6 months) for the average recreational runner. You should definitely replace your shoes if the outsole has begun to show wear or if the shoe starts to lean inwards or outwards (when viewed from the rear). As the shoe ages it loses its shock absorbency. Specifically, after the first 50 miles, 15% of the midsole's shock absorption capability is lost, and 55% is lost between 400-500 miles. Therefore, more force is transferred to your legs. When your feet hit the ground while running, the force transferred to your legs is 3-5 times your body weight and your feet hit the ground 600 times during a one mile run. Proper running shoes can help protect you from many running injuries when training properly.

Sources:
Consumer's Report; Runner's World; FM21-20; Cook SD 1985 & 1990 and Handouts/Presentations from the Physical Therapy Clinics at Ft. Hood, Ft. Jackson, Heidelberg, and Ft. Meade

Last Updated May 2007

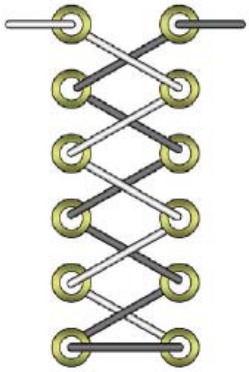
Appendix D: Lacing Techniques Handout

U.S. Army-Baylor University
Doctoral Program in Physical Therapy
Army Medical Department Center & School
Fort Sam Houston, TX 78234

LACING TECHNIQUES

Without proper lacing, your running shoes will not fit or function properly. Here are some lacing techniques that can be used to improve the fit of a pair of shoes or to help relieve painful pressure.

THE TRADITIONAL METHOD: This is the most effective method for most individuals and shoe types.

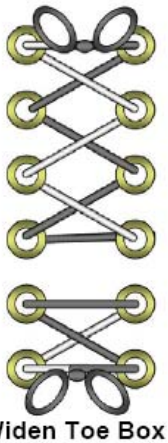


Traditional

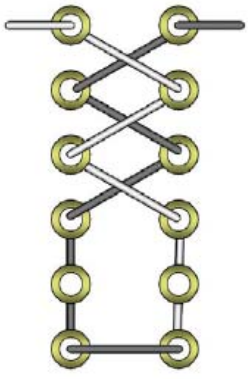
TO WIDEN THE TOEBOX OF A SHOE:

Technique #1: This technique uses two laces per shoe, allowing you to adjust the tightness in the toe box and the rest of the shoe independent of one another. With this technique you can relieve pressure in the toe box without compromising the fit of the rest of the shoe. To keep a snug fit around your heel, combine this technique with the "lace lock" technique described below.

Technique #2: Do not start the "criss-cross" method until the 2nd or 3rd hole to minimize tightness in the toe box region.



Widen Toe Box Technique #1



Widen Toe Box Technique #2

TO IMPROVE HEEL FIT:
The "lace lock" or "loop lace" techniques can help prevent your heel from sliding up and down excessively in the shoe. This may happen if the heel cup of the shoe is too wide or if one of your feet is longer than the other (which is common).

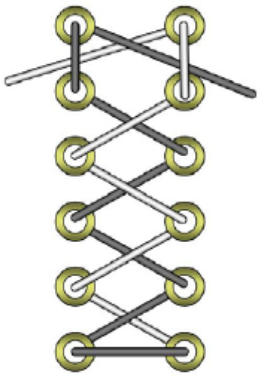
Lace-Lock Technique:

1. Lace normally until the 2nd to last set of eyelets.
2. Create a vertical section by feeding the laces upwards to the last set of eyelets on the same side of the shoe.
3. Now cross the lace over to the opposite side of the shoe and feed it through its vertical section.
4. Pull tight and tie normally.
5. Note if you have shoes with an extra set of eyelets off to the side at the top of the shoe, lace through those eyelets when using this technique.

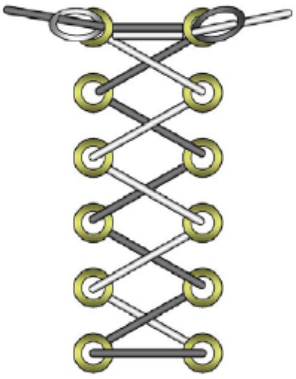
Loop-Lace Technique:

1. This is similar to the technique above, except that you create a "loop" with the lace in the top set of eyelets.
2. Next, put each lace through the "loop" on the opposite side of the shoe.
3. Pull tight and tie normally.

**Be careful not to pull the lace too tightly. Lacing too tightly can make the top of your foot sore.



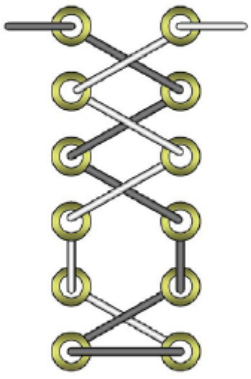
Lace Lock



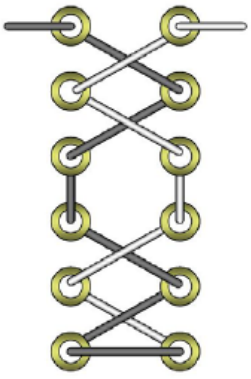
Loop Lace

TO NARROW THE FIT: Use the "lace-lock" technique for improving heel fit, but create the loops between the 2nd and 3rd or 3rd and 4th eyelets. This will snug up the midfoot of the shoe, which is critical for a good fit in those with a narrow foot. More "lace-locks" created will provide a tighter fit.

FOR PAIN ON THE TOP OF THE FOOT OR FOR THOSE WITH HIGH INSTEP:
Sometimes pressure or pain can occur on the top of your foot when wearing a shoe that is not deep enough for your foot. This technique uses the traditional "criss-cross" method but "skips" crossing over the tongue at the highest part of the foot. You can vary the pressure across the top of the foot by varying the holes skipped or by skipping over two holes before crossing again.



High Instep



High Instep (Option)

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What are the benefits of aerobic conditioning? Get ready to prepare for the Par-Q test!

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- How to choose aerobic activities
- Program design

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Everything you need to start and maintain a weight training program.

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- Circuit layout options
- Checklist for safety
- How to design a circuit training workout
- Risky exercises to avoid
- Strength and cardio stations

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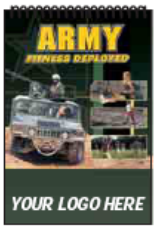

Developed especially for deployed personnel. This guide presents a complete exercise program with a 6-ft resistive tubing.

- How to train with tubing
- 33 fully-illustrated exercises
- Warm-up and stretching
- One-week sample program
- Safety tips
- Strength training tips

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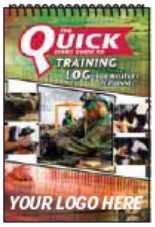
TRAINING LOG for Military Personnel



The most effective training logbook available! Logging your training sessions is the only way to track your progress. Color-coded sections allow you to track both aerobic work- outs and weight training sessions for a period of 2 years. Exercise information includes:

- Activity
- Duration
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- Heart rate
- Weight

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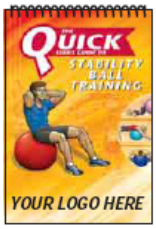

Stability balls are widely used for improving balance, coordination, functional and athletic conditioning, strength, flexibility and core conditioning. Learn how to incorporate the stability ball in your fitness program.

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- Ball size
- Core conditioning
- Beginner, intermediate and advanced exercises

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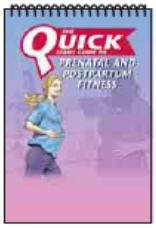

This guide provides guidelines for developing your personal program of safe and effective exercises during and after pregnancy.

- Benefits for women and their babies
- Sample training program
- Components of an exercise program
- Mind/body relaxation
- Nutritional facts

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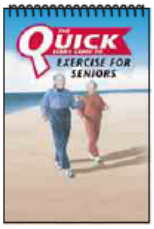
EXERCISE FOR SENIORS



No matter how old you are, physical activity is one of the most important things you can do to maintain overall well-being. As you age, years of neglect and abuse catch up, requiring that you fine tune your body. It's never too late to bring about a positive change that will make a difference.

- Why exercise?
- Getting started
- Flexibility
- Strength
- Cardiovascular exercise

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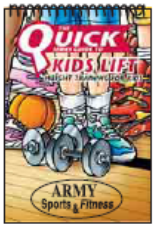

This guide presents the basics of weight training for kids. Everything kids and parents need to know to ensure a safe, effective and enjoyable exercise program. Kids learn to train safe – train smart.

- Stretching guidelines and exercises
- Progress and motivation
- Training equipment
- Resistance training

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WEIGHT MANAGEMENT

This guide offers suggestions and behavior change strategies for effective and safe weight loss and maintenance. Equip yourself with tips for managing your cravings, surviving restaurants and staying motivated.

- *Ready for change?*
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- *Best eating practices*
- *Tracking your habits*
- *Preventing relapse*
- *BMI Chart*

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PERFORMANCE NUTRITION for Military Personnel

Learn which foods supply your body with the right kind of energy for optimal performance. Handy nutritional value grids can increase your awareness about the foods you eat, and help you make the right choices.

- *Nutritional guidelines*
- *Carbohydrates*
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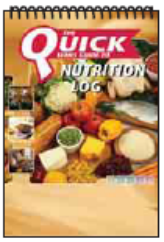

Awareness is the key step to changing your eating habits. Track your nutritional intake using 2 different methods.

- *Nutritional information for over 100 food items*
- *12 weeks of log pages*
- *Activity and weight charts*

72 Log Pages

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KNEE REHABILITATION

Combined with your physician's recommendations, the information in this guide can help you prevent knee injuries and compliment your rehabilitation program.

- *Functional anatomy*
- *Common postural conditions*
- *Injury prevention*
- *Common injuries*
- *Rehabilitation*
- *Knee strengthening*

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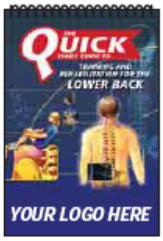
LOWER BACK REHABILITATION



Combined with your physician's recommendations, the information in this guide can help you prevent lower back injuries and compliment your rehabilitation program.

- *Anatomy and biomechanics (vertebrae, ligaments, discs)*
- *Acute and chronic strains and sprains*
- *Disc pathologies*
- *Disc herniation*
- *Rehabilitation programs*

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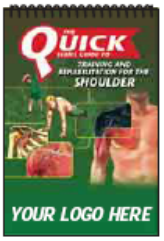
SHOULDER REHABILITATION



Combined with your physician's recommendations, the information in this guide can help you prevent shoulder injuries and compliment your rehabilitation program.

- *Phase-specific rehabilitation programs*
- *Flexibility and strengthening exercises*
- *Anatomy of the shoulder*
- *Modalities of treatment*

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FREEDOM FROM TOBACCO

Developed in consultation with the Centers for Disease Control and Prevention, this guide provides facts, tips and exercises to help you free yourself from tobacco. Whether you are quitting on your own, with group support, or already have quit, this self-help aid will keep you tobacco-free.

- *Smoking triggers*
- *Benefits and cost*
- *Harmful effects*
- *Slips and relapse*

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In consultation with the
CENTERS FOR DISEASE CONTROL AND PREVENTION

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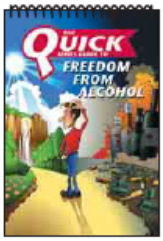
FREEDOM FROM ALCOHOL



Facts, tips and exercises to help you cut down or eliminate alcohol from your life. This educational tool provides a wealth of information, ideas and suggestions for problem drinking, as well as effective relapse prevention strategies.

- *Harmful effects*
- *Stress busters*
- *Relapse prevention*
- *Assess your drinking*
- *Slips and relapses*
- *Group treatment*

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Your lifestyle habits determine both the quality of your life and how long you will live. The choices you make today will determine your well-being tomorrow. This guide is based on the HealthierUS initiative's four pillars of health.

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- *Eat a nutritious diet*
- *Get preventive medical screening*
- *Avoid risky behaviors*

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