Building the Soldier Athlete

Injury Prevention and Performance Optimization

Mobility

Strength

Endurance

Building the Soldier Athlete

Contributions

Over the years, many outstanding leaders from across the Army have contributed to this body of work. While it is impossible to list all of the names individually, we would like to extend a special thanks to CPT Christine Iverson and LTC Jean Anderson who spent countless hours researching, developing and formatting this product. We would also like to thank the Soldiers and Civilians in the US Army Medical Specialist Corps, the Office of The Surgeon General's Proponency Office for Rehabilitation and Reintegration, the US Army Research Institute of Environmental Medicine, the US Army Physical Fitness School, US Army Medical Department Center & School, US Army Training and Doctrine Command, the Infantry Branch and US Special Operations Command. This project was supported in part by an appointment to the Knowledge Preservation Program at the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and USACHPPM.

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Advanced Physical Training for the Soldier – Athlete

Soldiers are Warriors. A Soldier on the battlefield is akin to professional athletes at the top of their game. Success in both professions demands physical performance optimization. The difference is that in order for a Soldier to optimize performance, he must possess the speed and mobility to get there, the strength and power to do the job and the endurance to complete the mission.

Physical readiness training (PRT) is a daily opportunity to build the valuable Soldiering skills of strength, power, speed and agility required to help Soldiers meet their mission. Providing emphasis on a variety of physical tasks enables commanders to observe the full physical readiness of the unit. It also allows an opportunity for more Soldiers to take pride in their skills. Soldiers excelling in different skills can boost unit and individual morale, inspiring Soldiers to take ownership of their own physical fitness.

The Army's current physical fitness program focuses primarily on muscular endurance and cardio respiratory fitness. It prepares Soldiers for the annual APFT, but does not optimize them for combat. These areas alone do not adequately address the operational fitness requirements of strength, speed, power, and agility. This manual compliments the US Army Physical Fitness School's Physical Readiness Training manual by providing a variety of advanced strength, mobility and endurance exercises and recommendations. Use it daily to help your Soldiers be successful and motivated Warriors. Army Strong!

In the most basic form of Soldiering physical success means having the ability to move, to acquire and to engage a target.

A Soldier must have the endurance to travel by foot to the objective (in some environments this involves several hours of uphill walking with a pack at altitude); the strength to defeat, move and climb over obstacles in his/her path; the mobility to skillfully maneuver on the objective and after extreme physical exertion, the stamina to control his/her breathing well enough to accurately fire a weapon at the target.

Battle Focused Training

The goal of any training program should be to accomplish the mission. In order to do this, you must take a good look at the unit's Mission Essential Task List (METL). Break down each METL task into the fitness categories below. This will allow you to design a fitness program aimed at improving the required tasks in your unit's METL.

An example of infantry METL tasks and the fitness skill required of each task:

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****

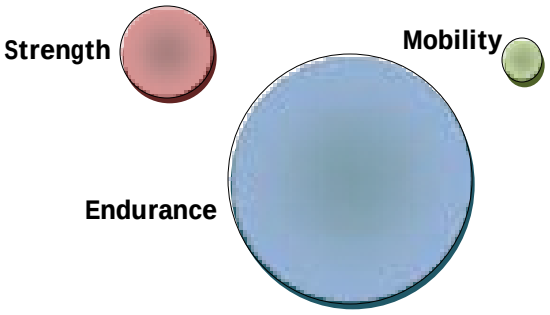
X – light

XX – moderate

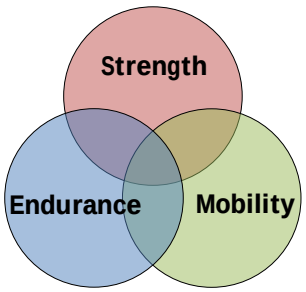
XXX - heavy

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

Current PT Focus:



Building the Soldier Athlete:



The definitions of the general components of the Building the Soldier Athlete Program are:

Strength - the ability to overcome resistance.
Endurance - the ability to sustain activity.
Mobility – the quality of movement (agility, balance, coordination)

Injury rates

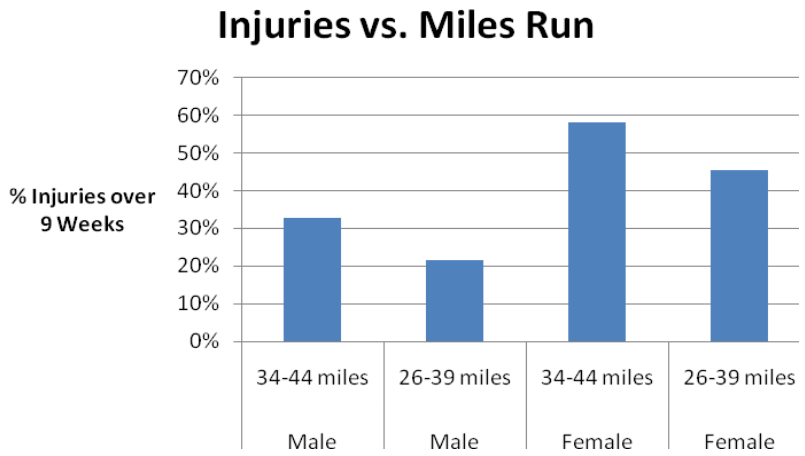
Risk Factors proven to make you more likely to suffer an injury include:

- Low Fitness Level
- Prior Injury
- Physical Inactivity
- Female Gender
- Over 25 years old
- Tobacco Use

Ways to reduce injury rates:

- Avoid over-training (see table below)
- Perform exercises that involve the entire body - e.g. agility drills
- Replenish nutrients within 1 hour of completing training
- Wear ankle braces for cutting activities if you have a history of a previous ankle sprain
- Wear mouth guards during contact activities
- Wear synthetic blend socks to prevent blisters
- Ensure that commanders take into account the various fitness levels of their Soldiers in order to balance risk of injury with training[1]

What the Research Tells Us About Overtraining



Soldiers who ran more (34-44 mi.) had more injuries than those who ran less (26-39 mi.).[2]

Gender	Miles Run over 9 weeks	Percent Injuries	2 Mile Run Time
Male	34-44 miles	33%	14.9 min
Male	26-39 miles	21%	14.8 min
Female	34-44 miles	58%	18.0 min
Female	26-39 miles	46%	17.8 min

The table above illustrates, a significantly lower weekly mileage resulted in slightly faster run times and a significantly lower injury rate.

Bottom line: **higher mileage produced more injuries but not faster runners**

The Basics of Fitness

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

- Progress no more than 10% per week (weight, time, speed or distance for example).
- First increase the intensity, then the duration (go faster and then longer).

Regularity: An effective physical training program requires regular, quality training.

Overload: To achieve muscle development, it is necessary to exceed the normal demands on the body. This is not exercising to "muscle failure."

- "Muscle Failure," implies using a muscle until it no longer works and then relying on other structures such as ligaments, tendons, and cartilage to complete the exercise. These structures may then be injured, requiring medical treatment.
- "Muscle Fatigue" is a more appropriate term and condition. Once your muscle fatigues, you can no longer maintain proper form, then you must modify the exercise to protect the other structures. For example, after performing multiple push-ups, move to your knees to continue with proper form.

Variety: Adding variety to an exercise program helps avoid injuries while providing challenging training. Vary the type of exercise to include muscular strength, muscular endurance, aerobic endurance, anaerobic endurance, flexibility, and mobility.

Recovery: Recovery is the single most violated principle of exercise and is absolutely essential to minimize overuse injuries. There are two main ways to recover following a hard workout:

- Follow a hard workout with a rest day or easy day.
- Exercise a different body region or perform a different type of exercise the day after a hard workout (i.e. agility followed by endurance training).

Balance: Balance all of the principles of fitness to avoid poor training or risk of injury.

Specificity: Soldiers are athletes, and their sport is combat. To improve in combat it is important to incorporate these Soldier skills into every physical training session, and this guide illustrates how.

Principles of Physical Readiness Training

Army PRT is guided by the overarching principles of precision, progression, and integration. These principles ensure that all PRT sessions, activities, drills, and exercises are performed correctly within the appropriate intensity and duration for optimal conditioning and injury control.

Precision: Precision implies that the quality of movement is just as important as the weight lifted or repetitions performed. It improves physical skills and abilities and can decrease the likelihood of injury due to faulty movement. Precise execution standards in all PRT activities ensure proper development of fundamental movement skills.

Progression: Progression is the systematic increase in the intensity and duration of PRT activities. The proper progression allows the body to positively adapt to the stresses of training. If progression in intensity and/or duration is too rapid, the Soldier cannot adapt to the demands of training or recovery. This process leads to over-training or the possibility of injury. Phased training ensures appropriate progression.

Integration: Integration uses multiple training activities to achieve balance and recovery between activities in the PRT program. Warrior tasks often require a blend of strength, endurance, and mobility, and PRT activities are designed to challenge all three components in an integrated manner. For example, conditioning and climbing drills develop the strength, mobility, and physical skills to negotiate obstacles. Movement drills are designed to improve running form, movement under direct or indirect fire, and casualty evacuation. The drills and activities in PRT integrate essential Soldier tasks serving as a critical link in the chain of overall Soldier readiness.

Anaerobic vs. Aerobic Training

Anaerobic exercise is exercise intense enough to trigger anaerobic metabolism (without oxygen to muscles used). It is used in non-endurance sports to promote strength, speed and power and by body builders to build muscle mass. Muscles trained using anaerobic exercise develop differently when compared to aerobic exercise. This leads to greater performance in short duration, high intensity activities, which last from mere seconds to a maximum of about 2 minutes. Examples of anaerobic exercise would include sprinting, lifting, and jumping.
Initial recommendations for anaerobic training: start with a 1:2 work/rest ratio and after a few months progress to a 1:1 work/rest ratio. An example of a 1:2 work/rest ratio is an interval workout of sprinting 30 seconds and then jogging or walking for 1 minute (repeat 5-10 times).

Aerobic exercise includes lower intensity activities performed for longer periods of time. Activities such as walking, running, swimming and cycling are aerobic and require a great deal of oxygen to generate the energy needed for prolonged exercise.

Lactate threshold is the exercise intensity at which lactic acid starts to accumulate in the blood. Lactic acid is a byproduct produced when the muscles are using oxygen faster than one can re-supply the oxygen during breathing. A low threshold means the body is not using oxygen to the best of its ability and training to improve your threshold can be beneficial.

VO_{2max} is the maximum capacity of an individual's body to transport and utilize oxygen during exercise. We can train our Soldiers to increase both the VO_{2max} and the lactate threshold by including anaerobic training (intervals, speed and agility drills, and resistance training) in our physical training.

Performance Optimization: Many of our tasks as Soldier athletes require a combination of aerobic and anaerobic activities to optimize performance. However, most of our current PT programs focus primarily on aerobic training. Recent research demonstrates that in order to improve performance in activities such as individual movement techniques, operations in urban terrain and combatives, the training must include sessions that involve short (less than 40 second) bursts of anaerobic exercise with short recovery intervals (less than 30 seconds) between bursts. [3] Some of our most important tasks (including sprinting into a building or lifting a heavy piece of equipment) require anaerobic ability.

Training Intensity

Many athletes find heart-rate training beneficial to ensure proper intensity. Depending on your fitness level, the recommended aerobic exercise intensity is 65%-90% of your maximum heart rate (HRmax).[4]

Calculate your HRmax by using this formula: 220 minus your age.
Example: 30 year old

- HRmax is 220 - 30 = 190 beats per minute (bpm)
- THR for 65% HRmax is 0.65 x 190 = 123.5 bpm
- THR for 90% HRmax is 0.90 x 190 = 171 bpm

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. Dynamic stretching exercises warm-up the muscles and body tissues by moving the body through the full available range of motion. Dynamic stretching can enhance power when performed before exercise.[5] An example of a dynamic stretch would be "The Bend and Reach." Stretching muscles statically (holding the stretch for more than 15 seconds) before exercise can actually decrease performance during power and agility activities. Current research recommends static stretching after exercise to help decrease the risk for muscular injuries.[6],[7]

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.[8]

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 that are very flexible are at greater risk for injury if they include stretching in their exercise routine.

Fitness maintenance

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

Fact: You can maintain your performance level for up to 90 days as long as you maintain your previous level of INTENSITY. If you must limit your exercise program for 3 months, it is best to exercise 15-20 minutes 1 to 2 times per week. The key is to maintain your level of intensity.

Foot type

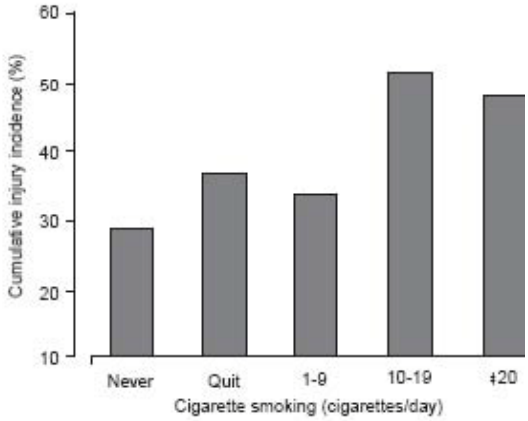
Myth: Flat footed individuals are at higher risk for injury.

Fact: The research is mixed in this area. Those with flat feet have a floppy foot and those with high arches have rigid feet. In both cases good running shoes are essential in order to provide some shock absorbability and decrease the forces that go through the lower extremities.

Smoking and tobacco

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

Fact: Smoking and tobacco use increase the risk for injury and prolong the time it takes to heal from an injury because nicotine prevents oxygen from getting to the injured muscles, soft tissues, and bones.[9]



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.

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: Exercising at lower intensities burns fewer calories and less fat overall than exercising at a higher intensity. In addition, with higher intensity exercise, your metabolic rate remains elevated throughout the day allowing you to burn even more calories. The metabolic rate is the rate at which your body burns calories to maintain itself.

Conduct of Physical Readiness Training

Training Phases

Similar to units going through the ARFORGEN cycle, the individual Soldier utilizes a phased approach to physical readiness training. Every stage plays a vital role in ensuring injury prevention and performance optimization. You can also think of phasing similar to an athlete's training cycle from preseason, to regular season, to playoffs and the post season.

Phase I – Recovery (RESET) – recover from deployment, block leave, injury, training, or prolonged absence from unit PRT (lasts 2-3 months). After prolonged periods of decreased exercise levels, PRT should consist of lower intensity programs that emphasize a gradual return to the basic conditioning blocks- strength, mobility, and endurance. This phase is similar to a sports team in the off season when returning to exercise in preparation for higher intensity preseason workouts.

Phase II - Conditioning (TRAIN) – build a solid foundation of physical abilities (lasts 4-6 months). This phase builds on the recovery phase by developing foundational fitness and fundamental movement skills by increasing the exercise intensity in the building blocks of strength, mobility and endurance. This includes performing essential physical skills associated with Soldier tasks. A variety of training activities with precise standards of execution ensures that bones, muscles, and connective tissues gradually toughen, rather than break. This phase is similar to a sports team in the preseason where conditioning intensifies in preparation for a "peaking" phase prior to the beginning of the competitive season.

Phase III - Ramp Up (READY) – prepare for assessment and validation just prior to deployment (lasts 3-4 months). This phase includes more demanding PRT activities that incorporate METL/mission tasks essential to a unit's success. These are the most intense and performance oriented exercise activities done in preparation for a prolonged deployment or FTX. Exercise options combine strength, mobility and endurance with the focus on attaining peak physical fitness. Example activities include individual movement techniques, casualty carries, obstacle courses, and combatives. **Caution**: To optimize performance, leaders must control for injuries while pushing the physical limits of their Soldiers. This phase is similar to an athlete's attempt to achieve top physical conditioning and form (attempting to "peak") just as the competitive season begins.

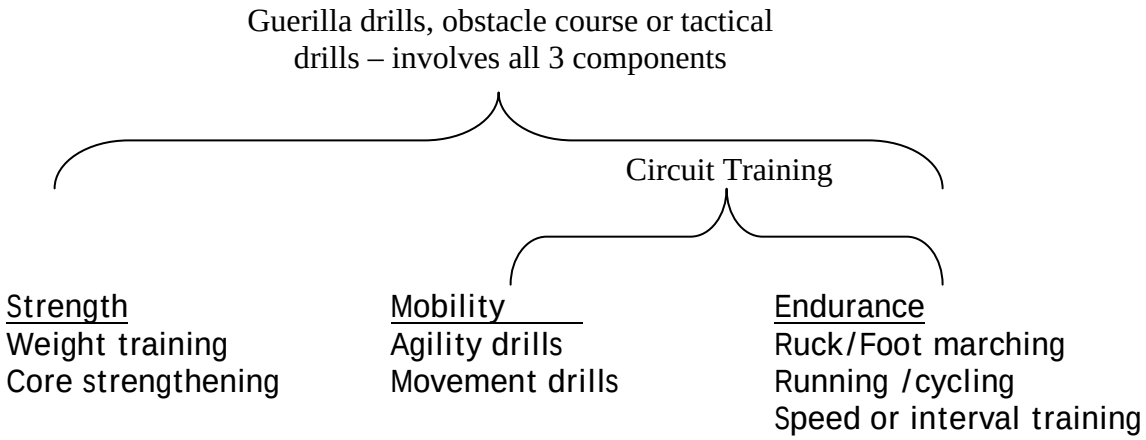
Phase IV - Sustaining (AVAILABLE) – deployed and/or performing combat missions (lasts 6-12+ months). This phase consists of Soldiers performing regular missions in a deployed environment. Depending on individual missions, some Soldiers are able to maintain fitness levels through the conduct of missions, while others lose peak fitness due to mission requirements, lack of time or unavailable fitness facilities. If possible, maintain exercise at least 1-2 times a week at the same intensity level. For further guidance, see the Myth-busters section of this manual and Appendix G. This phase is similar to an athlete that is competing in their respective sport and may not maintain peak fitness as focus shifts to the competition season.

PRT Development

Physical Readiness Training development should follow specific training guidelines and include the following three elements: Preparation, Activity, and Recovery. Optimal time for PRT is 75-90 minutes per session, with a minimum allotted time of 60 minutes per regular scheduled PRT session.

Preparation (10-15 minutes): conducted prior to all PRT activities
Activity (30-60 minutes): addresses specific goals in the areas of strength, endurance and mobility and takes up the majority of the training time

- Conduct a minimum of 2-3 strength & mobility days each week
- Conduct 2-3 endurance & mobility days (with at least one day of interval training) each week
- Alternate strength & mobility training days with endurance & mobility training days
- Sample activities include:



Recovery (10-15 mins): conducted after the completion of all PRT activities.

Potential Schedules

The new Physical Readiness Training Manual that replaces FM 21-20 has 12-month training schedules to assist leaders in developing programs that will optimize their Soldiers' performance. The following pages provide additional example schedules for PRT throughout the first three training phases. They provide additional ideas for leaders. Developing schedules well in advance and in conjunction with unit training calendars will maximize precious training time and resources.

Some activities require the use of additional facilities or equipment. PRT preparation and scheduling should include securing such resources or reserving training space just as units would do for any other training requirement or exercise.

Sample 4-Week Schedule for Phase I – Recovery (RESET)

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Preparation	Preparation	Preparation	Preparation	Preparation
	Starter Intervals	Low-impact cardio	Movement Drills	Conditioning Drills	Sports
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core strength	
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 2	Preparation	Preparation	Preparation	Preparation	Preparation
	300yd shuttle run & 30:60s	Conditioning Drills	Last Man Up drills	Low-impact cardio	Foot march
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core strength	
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 3	Preparation	Preparation	Preparation	Preparation	Preparation
	Cone drills	Circuit Training	Starter Intervals	Pool – water aerobics	Release Run
	U Push/L Pull	L Push/U Pull	L Pull/U Push		U Pull/L Push
	Core strength	Core strength	Core strength		Core Strength
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 4	Preparation	Preparation	Preparation	Preparation	Preparation
	200m Turn and Burn	Combatives	300yd shuttle run & 30:60s	Low-impact cardio	Foot march
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core strength	
	Recovery	Recovery	Recovery	Recovery	Recovery

Color Key
Preparation (warm-up)
Anaerobic Endurance
Aerobic Endurance
Strengthening
Core Strength
Combination Activities
Recovery (cool-down & stretch)

*Establish ability groups for running activities by administering a baseline APFT.

Sample Schedule for Phase II – Conditioning (TRAIN)

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Preparation	Preparation	Preparation	Preparation	Preparation
	200m Turn & Burn	Low-impact cardio	Movement Drills w/ IOTV & stick	Circuit Training	Foot march
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core strength	
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 2	Preparation	Preparation	Preparation	Preparation	Preparation
	300yd shuttle run & 60:120s	Medicine Ball drills	Agility Ladder drills	Pool – lap swim or pool running	Terrain Run
	U Push/L Pull	L Push/U Pull	L Pull/U Push		U Pull/L Push
	Core strength	Core strength	Core strength		Core strength
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 3	Preparation	Preparation	Preparation	Preparation	Preparation
	Ability Group Run	METL Task PT	Quarter Repeats	Combatives	Foot march
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core Strength	
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 4	Preparation	Preparation	Preparation	Preparation	Preparation
	Movement drills & cone drills	Low-impact cardio	Release Run	Medicine Balls	Sports
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core strength	
	Recovery	Recovery	Recovery	Recovery	Recovery

Color Key
Preparation (warm-up)
Anaerobic Endurance
Aerobic Endurance
Strengthening
Core Strength
Combination Activities
Recovery (cool-down & stretch)

* Establish ability groups for running activities by administering a baseline APFT.

Sample Schedule for Phase III – Ramp-up (READY)

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Preparation	Preparation	Preparation	Preparation	Preparation
	Quarter Repeats	Circuit Training	Movement Drills w/IOTV & weapon	Medicine Balls	Foot march
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core strength	
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 2	Preparation	Preparation	Preparation	Preparation	Preparation
	300yd shuttle run & 60:120s	Log Drills	Hurdle drills	Low-impact cardio	Obstacle Course
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core strength	
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 3	Preparation	Preparation	Preparation	Preparation	Preparation
	Ability Group Run	Medicine Balls	Ladder Intervals	Pool – water aerobics	Foot march
	U Push/L Pull		L Push/U Pull		
	Core strength	Core strength	Core strength		
	Recovery	Recovery	Recovery	Recovery	Recovery
Week 4	Preparation	Preparation	Preparation	Preparation	Preparation
	Hill Repeats	Combatives	Movement drills w/IOTV, weapon & ruck	METL Task PT	Foot march
	U Push/L Pull	L Push/U Pull	L Pull/U Push	U Pull/L Push	
	Core strength	Core strength	Core strength	Core strength	
	Recovery	Recovery	Recovery	Recovery	Recovery

Color Key
Preparation (warm-up)
Anaerobic Endurance
Aerobic Endurance
Strengthening
Core Strength
Combination Activities
Recovery (cool-down & stretch)

* Establish ability groups for running activities by administering a baseline APFT.

Idea Book

The following pages consist of specific exercises to assist leaders in the development of PRT sessions. The book is organized with the Preparation Drills at the beginning; Activity Drills in the middle focusing on strength, mobility and endurance; and Recovery Drills at the end, just as they would be used in PRT sessions. The majority of the exercise pages were designed to be printed, folded in half, laminated, and put on a ring to use as exercise references during the PRT session.

Preparation Drills

Purpose: to prepare the Soldier for PRT activities
Objectives:

- ⇧ Body temperature
- ⇧ Heart rate
- ⇧ Flexibility of joints & muscles
- ⇧ Responsiveness of nerves & muscles

Note: Joint rotations and static stretches (e.g. long sit, groin stretch, etc.) are no longer recommended during the warm-up. The preparation drills provide sufficient joint range of motion and fully lengthen key muscle groups, eliminating the need for separate stretching exercises.

Preparation exercises are performed at the beginning of every PRT session and last approximately 10 minutes. The focus is always on quality of movement, not number of repetitions or speed of movement. A calisthenics cadence that is too fast will not allow Soldiers to achieve a full range of movement, and may not adequately prepare them for further exercises/activities.

Conduct the 10 preparation exercises in the order and cadence listed:

Preparation

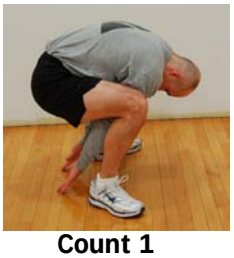
#	Exercise	Cadence
1	The Bend and Reach	5 repetitions slow
2	The Rear Lunge and Reach	5 repetitions slow
3	The High Jumper	5 repetitions moderate
4	The Rower	5 repetitions slow/moderate
5	The Squat Bender	5 repetitions slow/moderate
6	The Windmill	5 repetitions slow/moderate
7	The Forward Lunge & Reach	5 repetitions slow
8	The Prone Row	5 repetitions moderate
9	The Bent-leg Body Twist	5 repetitions slow
10	The Push-up	5 repetitions moderate

If performing a running activity after the preparation drills, complete the warm-up with a slow, 2-3 minute jog.

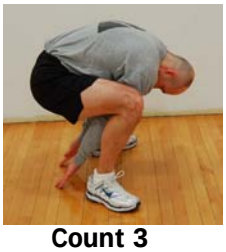
Preparation Drill, Exercise 1

The Bend and Reach


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow. Avoid bouncing as this may place an excessive load on the spine.
Start Position: Straddle stance with arms overhead.
Count:
1. Squat with the heels flat as the spine rounds forward to allow the straight arms to reach as far as possible between the legs.
2. Return to the starting position
3. Repeat count one.
4. Return to the starting position.

Preparation Drill, Exercise 2

The Rear Lunge and Reach


Start Position


Count 1


Count 2

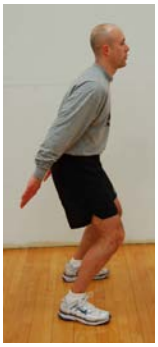

Count 3


Count 4

Cadence: Slow – on counts one and three, move into position in a slow, controlled manner to allow full range of motion.
Start Position: Regular stance with hands on hips.
Count:
1. Take an exaggerated step backward with the left leg, touching down with the ball of the foot while raising both arms fully overhead.
2. Return to the starting position.
3. Repeat count one with the right leg.
4. Return to the starting position.

Preparation Drill, Exercise 3

The High Jumper


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Moderate – Don't exaggerate count three on the first few repetitions, gradually progress to higher jumps.
Start Position: Feet shoulder distance apart with the hips and knees bent. The trunk is straight but leaning forward at about 45 degrees. The arms are straight and directed to the rear.
Count:
1. Swing arms forward and jump a few inches.
2. Swing arms backward and jump a few inches.
3. Swing arms forward and vigorously overhead while jumping forcefully.
4. Repeat count two. On the last repetition, return to the starting position.

Preparation Drill, Exercise 4

The Rower


Start Position


Count 1


Count 2

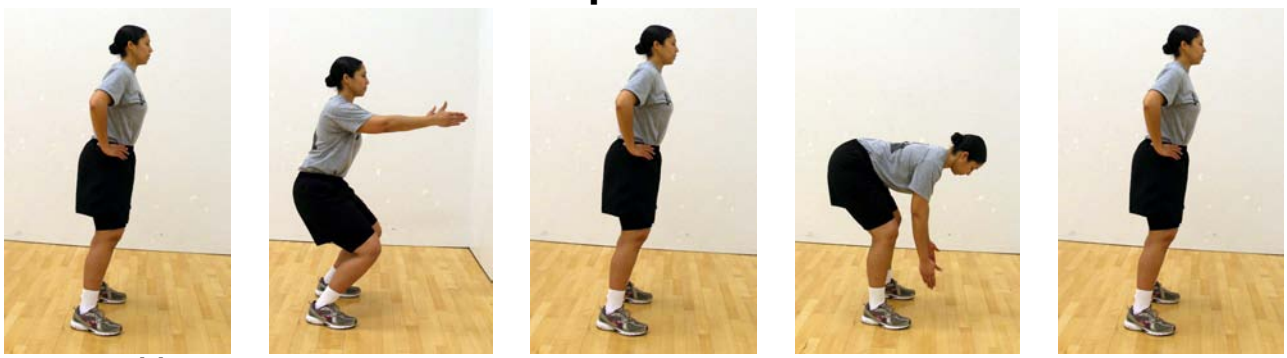

Count 3


Count 4

Cadence: Slow/Moderate
Start Position: On back, arms overhead, feet together and pointing upward. The chin is tucked and the head is 1-2 inches above the ground. Arms are shoulder width apart with palms facing with fingers and thumb extended and joined. Avoid arching your back by tightening the abdominal muscles.
Count:
1. Sit up while swinging arms forward and bending at the hip and knees. At the end of the motion, arms will be parallel to the ground, palms facing inward.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

Preparation Drill, Exercise 5

The Squat Bender

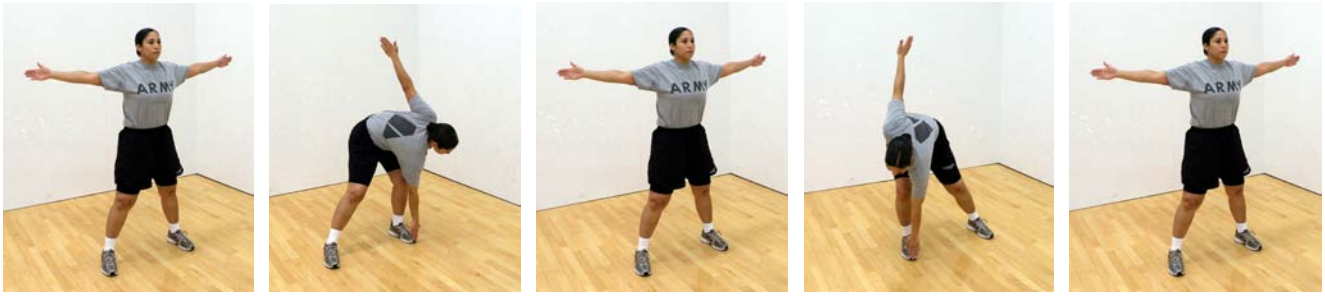


Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/Moderate – Avoid excessive stress on the back or knees by keeping your back straight and your knees from going beyond your toes.
Start Position: Straddle stance with hands on hips.
Count:
1. Squat while raising the arms to parallel with the ground, palms facing inward.
2. Return to the starting position.
3. Slightly bend the knees while bending forward at the waist and reaching toward the toes.
4. Return to the starting position.

Preparation Drill, Exercise 6

The Windmill



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/Moderate
Start Position: Straddle stance with arms sideward, palms down.
Count:
1. Bend the hips and knees while rotating to the left. Reach toward the outside of the left foot with the right hand. Pull the left arm rearward to maintain a straight line with the right.
2. Return to the starting position.
3. Repeat count one to the right.
4. Return to the starting position.

The Forward Lunge and Reach


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow – avoid jerking the trunk to create momentum by springing off of the forward leg to return to the starting position.
Start Position: Regular stance with hands on hips.
Count:
1. Take an exaggerated step forward with the left leg while raising both arms fully overhead. Allow the left knee to bend until the thigh is parallel to the ground.
2. Return to the starting position.
3. Repeat count one with the right leg.
4. Return to the starting position.

The Prone Row


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Moderate – prevent overarching of the back by maintaining contractions of the abdominal and hip muscles throughout the exercise.
Start Position: On stomach with the arms overhead, palms face down, 1-2" off ground.
Count:
1. Raise the head and chest slightly while lifting the arms and pulling them rearward. Hands make fists as they move toward shoulders. Ensure that the toes remain on the ground.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

The Bent-Leg Body Twist


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow – Maintain an abdominal contraction and the opposite shoulder on the ground while rotating the legs.
Start Position: On back with the hips and knees bent to 90-degrees and legs/feet together. Arms are at shoulder level with elbows straight and palms down with fingers spread.
Count:
1. Rotate the legs to the left while keeping the upper back and arms in place.
2. Return to the starting position.
3. Repeat count one to the right.
4. Return to the starting position.

The Push-Up


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Moderate.
Start Position: Move into the front leaning rest position, maintaining the body straight from head to heels.
Count:
1. Bend the elbows, lowering the body until the upper arms are parallel with the ground.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

Conditioning Drills

Conditioning Drill exercises develop upper and lower body strength, endurance, and mobility. Use these exercises during the activity portion of the PRT session or with other strengthening, endurance or mobility drills. Start with performing five repetitions of each exercise then progress to ten repetitions. Focus on quality of movement, not the number of repetitions or speed of movement.

Prior to initiating the conditioning drill exercises, Soldiers must be capable of performing 10 repetitions of the preparation drill exercises without resting between exercises. Once Soldiers can perform this to standard, they progress to the additional conditioning drills listed below. These exercises develop more complex motor skills while challenging strength, endurance, and mobility at a higher intensity.

Additional Conditioning Drills

#	Exercise	Cadence
1	The Mountain Climber	5 repetitions moderate
2	The Squat Thrust	5 repetitions slow/moderate
3	The Side Lunge and Reach	5 repetitions slow/moderate
4	The Double High Jumper	5 repetitions moderate
5	The Leg Tuck and Twist	5 repetitions moderate
6	The Single Leg Push Up	5 repetitions moderate
7	The Diagonal Lunge & Bend	5 repetitions slow/moderate
8	The Squat Jumper	5 repetitions moderate
9	The 8-Count Push Up	5 repetitions moderate
10	The Leaning Rest Rotation	5 repetitions slow

Conditioning Drill 2, Exercise 1

The Mountain Climber


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Moderate – Avoid excessive springing upward with each count.
Start Position: Perform a squat thrust to reach the front leaning rest position. Bring left foot forward, moving left knee toward chest.
Count:
1. Spring the lower extremities off the ground and exchange foot placement.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

Conditioning Drill 2, Exercise 2

The Squat Thrust


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow/Moderate – do not allow the trunk to sag on count two.
Start Position: Position of attention.
Count:
1. Squat and place the hands on the ground, shoulder width apart.
2. Thrust legs backward to a front leaning rest position.
3. Return to position one.
4. Return to the starting position.

Conditioning Drill 2, Exercise 3

The Side Lunge and Reach

Start Position


Count 1

Count 2

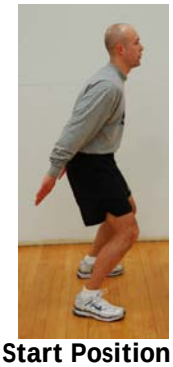

Count 3

Count 4

Cadence: Slow/Moderate – avoid bringing the bent knee beyond the toes. Avoid jerking the trunk back to the start position.
Start Position: Feet shoulder distance apart, hands on hips.
Count:
1. Lunge to the left as the right arm moves overhead to come in line with the right leg and trunk, palm facing inward.
2. Return to the starting position.
3. Repeat count one to the right.
4. Repeat count two.

Conditioning Drill 2, Exercise 4

The Double High Jumper


Start Position


Count 1


Count 2


Count 3

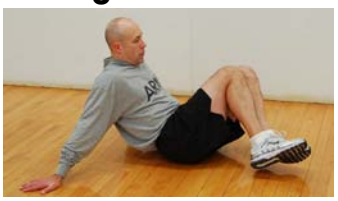

Count 4

Cadence: Moderate – gradually progress to higher jumps.
Start Position: Feet shoulder distance apart with the hips and knees bent. The trunk is straight but leaning forward at about 45-degrees. The arms are straight and directed to the rear.
Count:
1. Swing arms forward and vigorously overhead while jumping forcefully.
2. Swing arms backward and jump a few inches.
3. Swing arms forward and vigorously overhead while jumping forcefully.
4. Repeat count two. On the last repetition, halt at the starting position.

Conditioning Drill 2, Exercise 5

The Leg Tuck and Twist


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Moderate – protect the spine by not jerking the legs and trunk.
Start Position: Seated with trunk straight but leaning backward 45-degrees, arms straight, and hands on ground 45-degrees to the rear, palms down with fingers spread. Legs are straight, extended to the front and 8-12 inches off the ground.
Count:
1. Raise legs and draw the knees toward the left shoulder.
2. Return to the starting position.
3. Repeat count one in the opposite direction.
4. Return to the starting position.

Conditioning Drill 2, Exercise 6

The Single Leg Push Up


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Moderate – avoid lifting leg too high.
Start Position: Front leaning rest position.
Count:
1. Bend the elbows, lowering the body until the upper arms are parallel with the ground while raising the left foot until 8-12 inches off the ground.
2. Return to the starting position.
3. Repeat count one, bringing the right leg to 8-12 inches off the ground.
4. Return to the starting position.

Conditioning Drill 2, Exercise 7

The Diagonal Lunge and Bend


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow/Moderate – avoid bringing the bent knee beyond the toes. Avoid jerking the trunk back to the start position.
Start Position: Regular stance, arms straight overhead, fingers and thumbs extended and joined, palms facing inward.
Count:
1. Lunge at a 45-degree angle to the left as the trunk bends forward and the arms are lowered to either side of the left lower leg.
2. Return to the starting position.
3. Repeat count one to the right.
4. Return to the starting position.

Conditioning Drill 2, Exercise 8

The Squat Jumper


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Moderate – avoid bringing the bent knee beyond the toes. Avoid jerking the trunk back to the start position.
Start Position: Staggered crouch with the left leg back, fingers interlaced on top of head.
Count:
1. Jump and switch legs in mid-air to land with the right leg back.
2. Jump and switch legs in mid-air to return to the starting position.
3. Repeat count one.
4. Repeat count two.

Conditioning Drill 2, Exercise 9

The 8-Count Push Up


Start


Count 1


Count 2


Count 3


Count 4


Count 5


Count 6


Count 7

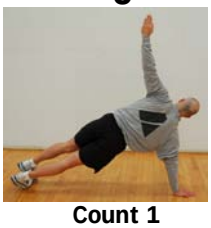

Count 8

Cadence: Moderate – avoid arching the low back by maintaining a strong abdominal contraction.
Start Position: Position of attention.
Count: 1 and 7. Squat and place the hands on the ground, shoulder width apart.
2. Thrust legs backward to a front leaning rest position.
3 and 5. Bend the elbows, lowering the body until the upper arms are parallel with the ground.
4 and 6. Return to the front leaning rest position.
8. Return to the starting position.

Conditioning Drill 2, Exercise 10

The Leaning Rest Rotation


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow – pause briefly on counts one and three, emphasizing proper body alignment. Avoid sagging the trunk by maintaining a strong abdominal contraction.
Start Position: Front leaning rest position.
Count: 1. Rotate the trunk to the left, reaching upward with left arm, palm out.
2. Return to the starting position.
3. Repeat count one, rotating to the right, reaching with the right arm.
4. Return to the starting position.

Core Strength & Balance Training

The current operational environment requires wearing heavy equipment for long periods of time and without a strong "core" Soldiers risk injury to their spine. Training the core muscles is best done using a 360 degree concept. This includes the abdominal and back muscles which form a supportive ring around your spine and the shoulder blade, pelvic, and buttock muscles which stabilize the trunk and assist in effective movements of the arms and legs. For all core exercises, contract/tighten the abdominal and lower back muscles as if you were bracing to take a punch. Avoid holding your breath.

Select exercises that provide a workout for the front, sides, back, and shoulders. This includes the abdominals, lower spine muscles, pelvic and buttock muscles, and shoulder blade stabilizers. The chart below gives a sample 12 week plan.

- Choose at least one exercise from each group: front, side, back & shoulder.
- For variety, choose different exercises each time.
- Perform each exercise to the standards in the chart.
- As Soldiers' abilities improve increase to two exercises per group.
- As deployment nears choose two from each group.

	Front							**Side**		
Week	front plank	crunches	double crunch	bent leg hold	frog kicks	bicycle crunches	sit-ups	side plank	side sit-up	bent-leg body twist
1	:30	2x25	20	:30	20	2x25	1:00	:20	2x25	10
2	:45	2x30	20	:30	20	2x25	1:20	:20	2x25	10
3	1:00	2x40	25	:45	25	2x30	1:40	:20	2x30	15
4	1:15	2x50	25	:45	25	2x30	1:40	:30	2x30	15
5	1:30	3x40	30	1:00	30	2x35	2:00	:30	2x35	20
6	1:45	3x50	30	1:00	30	2x35	2:00	:30	2x35	20
7	2:00	2x75	35	1:15	35	2x40	2x 1:20	:45	2x40	25
8	2:15	3x75	35	1:15	35	2x40	2x 1:20	:45	2x40	25
9	2:30	2x100	40	1:30	40	2x45	2x 1:40	:45	2x45	30
10	2:45	2x100	45	1:30	45	2x45	2x 1:40	1:00	2x45	30
11	3:00	3x100	50	1:30	50	2x50	2x 2:00	1:00	2x50	30
12	APFT							APFT		

	Back					**Shoulder**					
Week	shoulder bridge	shoulder bridge single leg	Reverse plank	prone row	superman	Y's	T's	L's	W's	External rotation	Internal rotation
1	:30	:15	:15	5	5	10	10	10	10	10	10
2	:45	:20	:15	5	5	15	15	15	15	10	10
3	1:00	:30	:30	10	5	20	20	20	20	15	15
4	1:15	:40	:30	10	10	20	20	20	20	15	15
5	1:30	:50	:40	15	10	25	25	25	25	20	20
6	1:45	1:00	:40	15	10	25	25	25	25	20	20
7	2:00	1:00	:50	2x10	15	30	30	30	30	25	25
8	2:15	1:15	:50	2x10	15	30	30	30	30	25	25
9	2:30	1:15	1:00	2x15	15	35	35	35	35	30	30
10	2:45	1:30	1:00	2x15	20	35	35	35	35	30	30
11	3:00	1:30	1:15	2x15	20	40	40	40	40	30	30
12	APFT					APFT					

NOTE: See the following pages for descriptions of the exercises. At the end of the section there are advanced exercises that should only be attempted once Soldiers are able to perform the other positions and hold them for 90 seconds – 3 minutes.

Forward Plank

A

B

C

D

Start Position: On stomach, forearms on the ground, elbows under shoulders, contract/tighten the abdominal and lower back muscles as if bracing to take a punch. Raise body up on elbows and toes so that it forms a straight line from the shoulders to the ankles (A). Avoid holding your breath.

Hold for a goal of 30 seconds working up to 3 minutes.

Keep your back straight or push your hips slightly upward. Avoid sagging the lower back.

Pictures B-D show increased difficulty.
B: arms move forward, come up on toes.
C: leg lifted slightly off ground, switch legs halfway through the time.
D: alternate arm and leg lifted. Switch lets halfway through the time.

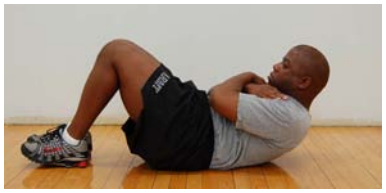
Choose the most difficult position that still allows you to maintain the proper position for the prescribed time.

Crunches

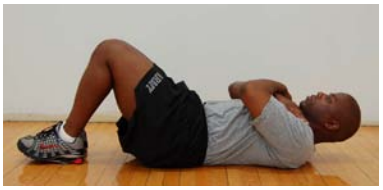
Start Position

Count 1

Count 2



Count 3



Count 4

Cadence: Slow.
Start Position: On back, knees bent and feet flat on the ground, arms crossed over the chest. Contract/tighten the abdominal and lower back muscles as if bracing to take a punch. Avoid holding your breath.
Count:
1. Lift your shoulder blades off the ground just until the tips of your shoulder blades come off the ground.
2. Return to the start position.
3. Repeat count one.
4. Repeat count two.

Double Crunches


Start Position


Count 1

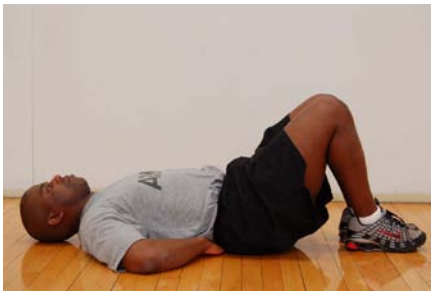

Count 2

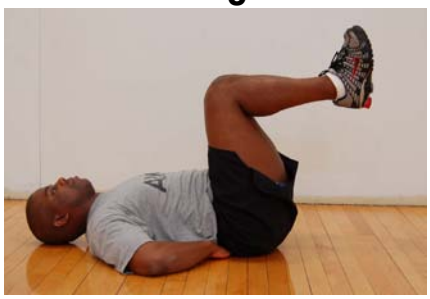

Count 3


Count 4

Cadence: Slow
Start Position: On your back with your knees bent and your feet flat on the ground, arms crossed over your chest, brace your abdomen.
Count:
1. Lift your feet slightly off the ground and your shoulder blades off the ground just until the tips of your shoulder blades come off the ground.
2. 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.
3. Return to count one position.
4. Return to the start position.

Bent Leg Hold

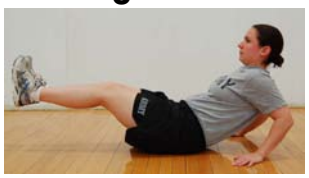




Start Position: Lying on the back, knees bent, feet on the ground, and place the fingers of both hands underneath the small of the back, not under your pelvis. Perform the exercise by raising the feet off the ground until both the hips and knees are flexed to 90 degrees. Next, contract the core muscles to flatten your lower back toward the ground. Take note of the amount of pressure on your fingers created by the contraction of your abdominals. Maintain the same degree of pressure as you slowly lower and straighten your legs. As soon as you can no longer maintain the same degree of pressure on your fingers, bring the legs slightly back and hold for the prescribed time.

Frog Kicks


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow/moderate.
Start Position: Sit with hands behind hips, knees bent so the heels touch the ground. Contract/tighten the abdominal and lower back muscles as if bracing to take a punch. Avoid holding your breath.
Count:
1. Perform the exercise by leaning your torso back and straightening your legs at the same time. Keep your feet off the ground.
2. Bring your torso back to the start position and tuck your knees towards your chest without letting your feet touch the ground.
3. Repeat count one.
4. Repeat count two.

To add challenge, when Soldiers can perform the recommended number of repetitions correctly, have them keep their hands off the ground during frog kicks.

Bicycle Crunches


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow.
Start Position: Start by lying on your back with knees and hips at 90 degree angles with lower leg parallel to the floor. Hands behind head, brace your abdomen.
Count:
1. Perform the exercise by moving left elbow toward right knee. Only use hands to support head/neck. Do not pull on head/neck.
2. Move right elbow to left knee in a slow, controlled fashion.
3. Repeat count one.
4. Repeat count two.

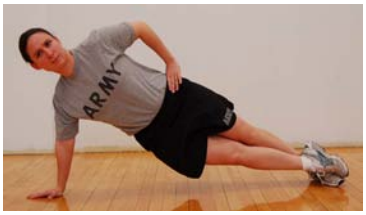
Side Plank Progression

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 on your elbow and tighten the stomach, back and buttock muscles.

Hold for a goal of 20 seconds to one minute, each side.

To add challenge, perform the same exercise with your legs straight.

To add more challenge, perform the same exercise with your legs straight and your elbow straight.



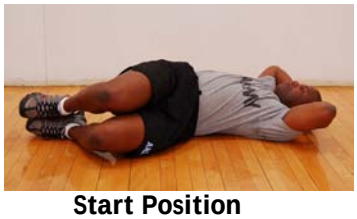
To add even more challenge, cross the lower foot over the top foot. Perform the same exercise keeping the top leg straight and your elbow straight.

Another challenging variation is to perform the same exercise with your legs straight and your elbow straight, then raise one leg or straighten the other arm out above you.

For the greatest challenge, perform the star position. Lift the top leg and straighten the other arm out above you. Keep hips lifted so that you form a straight line.

Choose the most difficult variety of the side plank that you can maintain for the standard time listed on the chart for the week you are doing.

Side Sit-Ups


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow.
Start Position: Lying on your back with knees bent, lift and shift hips to the left and twist the lower body so that the knees touch the floor on the left. Arms can be supporting the neck/head or crossed over your chest, brace your abdomen. Repeat on the right side.
Count:
1. Lift your head and shoulder blades off the ground, just until the tip of your right shoulder blade comes off the ground (left shoulder blade for the second set of the exercise).
2. Return to the start position.
3. Repeat count one.
4. Repeat count two.

Bent-Leg Body Twist


Start Position


Count 1

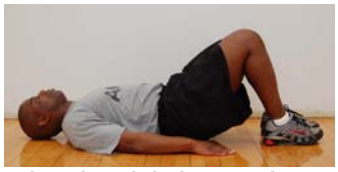

Count 2


Count 3

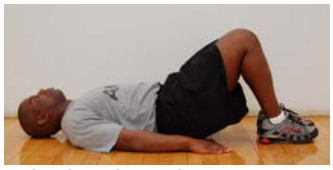

Count 4

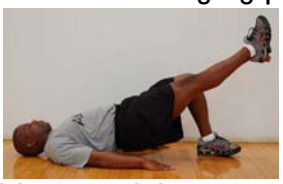
Cadence: Slow – same as Preparation Drill, exercise 9.
Start Position: On your back with your arms outstretched and your knees and hips bent at right angles. Keep your knees close together throughout the exercise.
Count:
1. Rotate the legs to the left while keeping the upper back and arms in place.
2. Return to the start position.
3. Repeat count one to the right.
4. Return to the start position.

Shoulder Bridge Progression

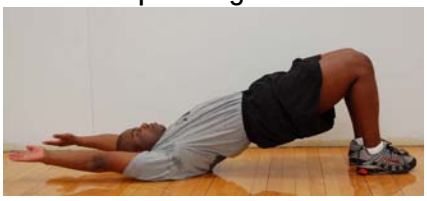
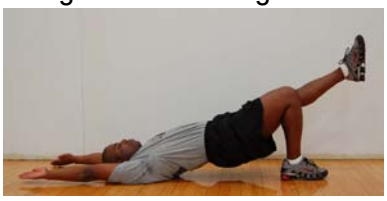



Start Position: On the back with knees bent. Tighten your stomach, back and buttock muscles and bring the hips up until the trunk and thighs form a generally straight line. Try to hold for 30 seconds to 3 minutes. See below for more challenging positions.






Begin in the above start position. After lifting the hips, straighten one leg. Keep your hips level (do not let one hip dip down lower). Hold for 15 to 90 seconds. Lower completely before repeating the exercise using the other leg.


Begin in the start position above. Bring your arms overhead and 3-6 inches off of the floor before lifting your hips and straightening your leg. Hold for 15 seconds to 90 seconds. Lower completely before repeating the exercise using the other leg.

Reverse Plank




Start Position: Sit on the ground with legs straight forward. Place hands on ground 12 inches behind buttocks, arms straight, fingers pointing toward the body. Keeping legs straight and ankles together, press through the heels and lift buttocks as high as comfortable. Roll shoulder back and down, move head to a comfortable position, and hold position for prescribed time. May use alternate position on elbows with fingers facing forward if necessary. To add more challenge, lift one leg while keeping buttocks lifted and even.

Prone Row


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Moderate – prevent overarching of the back by tightening stomach and buttock muscles throughout the exercise.
Start Position: On stomach with the arms overhead, palms face down, 1-2" off the ground.
Count:

1. Raise the chest slightly while lifting the arms and pulling them rearward. Hands make fists as they move toward shoulders. Ensure that the toes remain on the ground. (Look 2-4" in front of you to avoid arching the neck).
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

Superman


Start Position


Count 1


Count 2

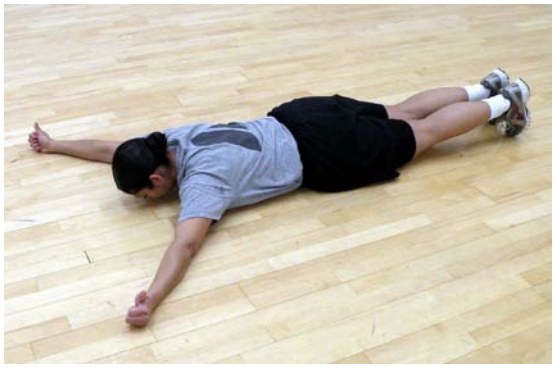

Count 3

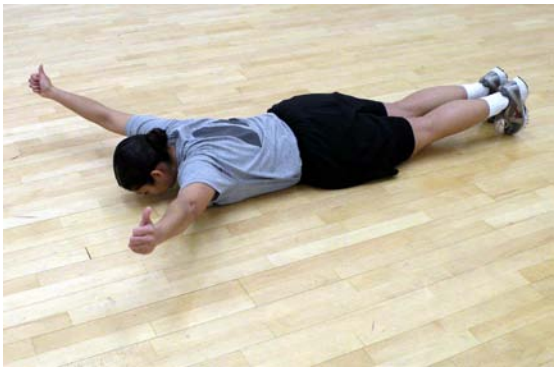

Count 4

Cadence: Slow to moderate.
Start Position: Prone position with the arms overhead, palms face down, brace your abdomen.
Count:

1. Raise the head, arms, and legs approximately six inches of the ground.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

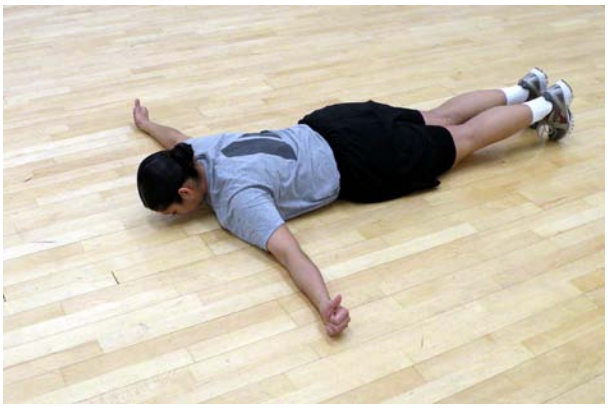
Y's





Start Position: Lying on the stomach, arms overhead in a "Y" position, elbows straight. Point both thumbs up, pinch shoulder blades together, lift arms 3-6 inches from ground while leaving the chest on the ground. Hold for 3-5 seconds, perform for 10-40 repetitions. Avoid arching the neck by keeping the head in line with the upper arms and looking only 2-4 inches in front.

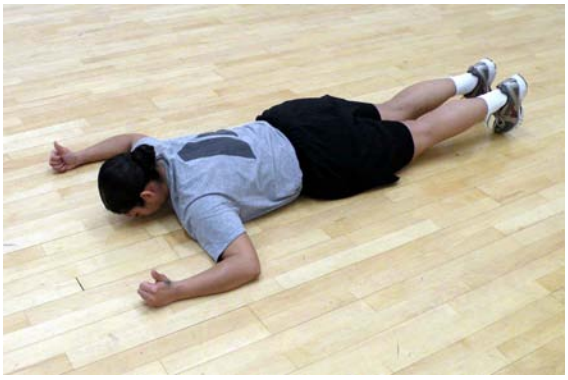
T's



Start Position: Lying on the stomach, arms out to the side in a "T" position, elbows straight. Point both thumbs up, pinch shoulder blades together and down, lift arms 3-6 inches from ground while leaving the chest on the ground. Hold for 3-5 seconds, perform for 10-40 repetitions. Avoid arching the neck by keeping the head in line with the upper arms and looking only 2-4 inches in front.

Core Strength, Shoulder 3

L's



Start Position: Lying on the stomach, arms out to the side, elbows bent 90 degrees in an "L" position. Point both thumbs up, pinch shoulder blades together and down, lift arms 3-6 inches from ground while leaving the chest on the ground. Hold for 3-5 seconds, perform for 10-40 repetitions. Avoid arching the neck by keeping the head in line with the upper arms and looking only 2-4 inches in front.

Core Strength, Shoulder 4

W's

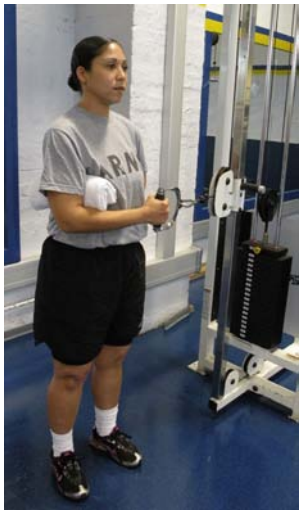
Start Position: Lying on the stomach, arms close to the side with elbows bent forming a "W" position. Point both thumbs up, pinch shoulder blades together and down, lift arms 3-6 inches from ground while leaving the chest on the ground. Hold for 3-5 seconds, perform for 10-40 repetitions. Avoid arching the neck by keeping the head in line with the upper arms and looking only 2-4 inches in front.

Shoulder External Rotation

Count 1

Count 1

OR



Count 1

Count 2

Cadence: Slow and controlled.
Start Position: Sidelying with towel Between upper arm and rib cage, elbow Bent to 90 degrees, firmly grip hand weight.
Count: 1. Raise the weight until arm is parallel with the ground.
2. Return to the starting position.

Cadence: Slow and controlled.
Start Position: Standing with towel between upper arm and rib cage, elbow bent to 90 degrees, firmly grip handle.
Count: 1. Move the handle so the arm is straight forward, keeping elbow at 90 degrees.
2. Return to the starting position.

Shoulder Internal Rotation

Cadence: Slow and controlled.
Start Position: Standing with towel between upper arm and rib cage, elbow bent to 90 degrees, firmly grip handle.
Count: 1. Move the handle so the arm is straight forward, keeping elbow at 90 degrees.
2. Return to the starting position.

T Stance

Start Position: Arms overhead, elbows straight, and fingers interlocked. Bend forward while standing on left leg, keeping body in a generally straight line from hands through right foot until body is parallel to floor. Hold for 15-30 seconds. Repeat on right leg.

The V-Up

Start Position

Count 1

Count 2

Count 3

Count 4

Cadence: Moderate – to protect the spine, do not jerk the legs and trunk to rise to the V-position.
Start Position: Supine, arms on ground 45-degrees to the side, palms down with fingers spread. The chin is tucked and the head is 1-2" off the ground.
Count:

1. Raise straight legs and trunk to form a V-position, using arms as needed.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

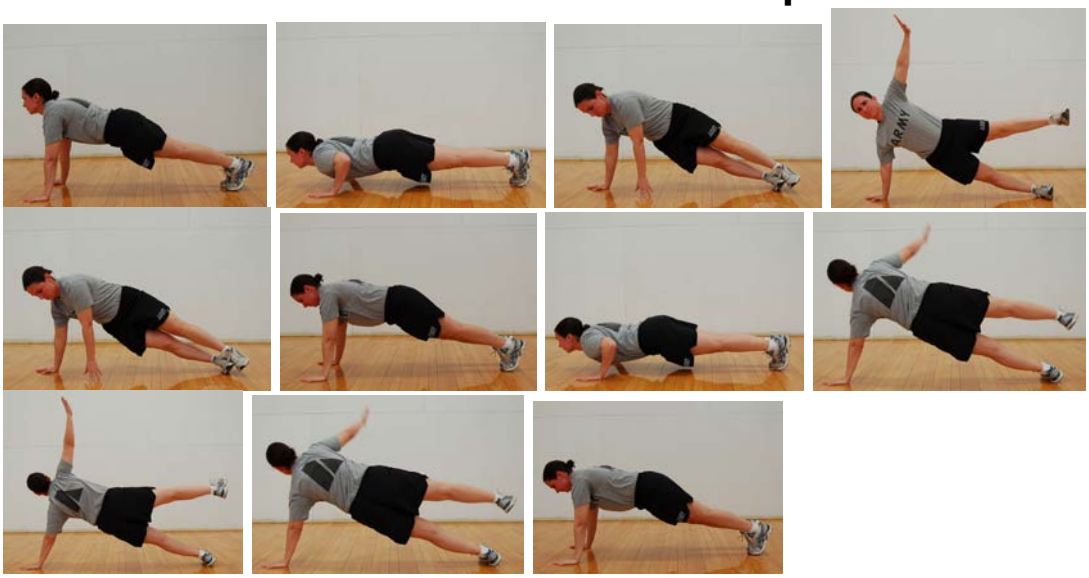
Core Strength, Advanced 3

Reverse Pike


Start Position: Lying on your back with your legs straight up in the air and your hands on the ground at your side. Lift your hips up off the ground without tilting your legs backwards. Keep them pointed straight upwards. Repeat.

Core Strength, Advanced 4

Plank Push Up



Start Position: Front leaning rest position. Go down into the push up position, on the way up go into the T or star position. Hold for 3-5 seconds, return to the front leaning rest and repeat the sequence to the opposite side. Perform from 30 seconds up to 3 minutes if form remains good.

Strength Training

Strength is the ability to overcome resistance. Soldiers need strength to foot march under load, enter and clear a building or trench line, repeatedly load heavy rounds, lift equipment, and transport a wounded Soldier to the casualty collection point. A well-designed strength training program improves the ability to perform Soldier specific tasks and control injuries. Initial training involves calisthenics or conditioning drills which develop the skills necessary for Soldiers to manipulate their own body weight. Later training involves more complex motions using resistance.

A strength training program can be initiated by following a 4-day cycle depending on training schedule availability. The program can be broken down into upper extremity and lower extremity exercises concentrating on a push/pull strategy. Historically, Soldiers have focused more on "push" exercises such as push-ups, bench press, and sit-ups while neglecting the relatively weaker upper and lower back muscles. Balanced muscular strength is an advantage when performing Soldier tasks such as wearing body armor. To further improve strength training exercises, Soldiers should contract/tighten the abdominal and lower back muscles as if you were bracing to take a punch. Avoid holding your breath.

A sample 4-day schedule is included below. Each day emphasizes high intensity in either upper or lower body, and either push or pull direction and should include 1-3 different exercises. The second category should include 1-2 exercises of a lower intensity. This is a tactic to balance muscular development and to prevent overtraining.

Day 1 – Upper Push (high intensity)/ Lower Pull (low intensity)
Day 2 – Lower Push (high intensity)/ Upper Pull (low intensity)
Day 3 – Lower Pull (high intensity)/ Upper Push (low intensity)
Day 4 – Upper Pull (high intensity)/ Lower Push (low intensity)

More strength training exercises are available in the new physical readiness training manual. Here are just a few examples of "push" and "pull" exercises:

Upper Body		**Lower Body**	
Push	**Pull**	**Push**	**Pull**
*Bench Press	*Pull ups	*Front squat	*Dead lift
*Dips	*Upright row	*Lunge with weights	Hamstring curl - physioball
Alternating dumbbell Press	Double arm snatch	Single leg squat	Single leg Romanian dead lift
Overhead press	Bent-over row	Iron Mike (Walking lunge)	Hamstring curl – sitting
Half kneel curl & press	Standing curl	Forward squat with 1 & 2 arm up	Hamstring curl - prone
Push ups	Lat pull down	Leg press	Hip extension with weights or tubing

*high intensity exercises

Phasing Recommendations

Training should be conducted using a periodization concept. Periodization adjusts the training cycle to utilize a logical sequence, changing intensities, rest and recovery in order to prevent overtraining and optimize performance. This should allow the Soldier athlete to peak as he or she goes into a combat environment. An example of an individual weight lifting periodized workout is included in Appendix A.

Strength training should be incorporated into the phasing concept. During the RESET phase Soldiers' duties may reduce the availability and priority for exercise. The RESET phase, should establish a baseline level of fitness from which to improve. During this phase, strength training should primarily involve body weight and calisthenics type exercises.

In the TRAIN phase, Soldiers begin to perform more advanced resistance techniques such as bench pressing, dead lifting, pull-ups, and squats. Repetition range during the early months of this phase should be between 10-15 reps for 2-4 sets. In the later months of the TRAIN phase, the goal is to increase intensity by lowering repetitions to 6-10 reps for 3-4 sets and increasing the weight.

The READY phase involves Soldiers increasing intensity to maximize strength gains for the impending deployment. Strength training can progress to 3-6 reps with higher weights for 2-3 sets per exercise. Ensure adequate recovery time between sets.

First focus on form in movement; then combination movements can be added for further difficulty. A variety of equipment may be available through local post facilities and should be utilized whenever possible. Alternative options and field expedient methods for resistance training can involve the use of Soldier-issued equipment (i.e. – body armor, rucksack, and other load bearing equipment). Options can include ammo cans, water cans, sand bags, rocks, tires, logs, litters, and other Soldiers. Spotters should be utilized when appropriate regardless of the strengthening medium.

Weight Training Machines

Weight training machines are a resource readily available. They are a good option for strengthening muscles particularly for Soldiers with minimal weight lifting experience. The weight training machines typically keep the body in a good position with limits for range of motion. Keep in mind that most machines typically allow one muscle group to work out in one plane. Most Soldiers will need to progress to more difficult exercises that involve multiple muscle groups working in combination and potentially in multiple planes. This should have a greater functional carry-over. Ensure balance with push/pull exercises.

Dumbbells/Barbells

The purpose of free weight training is to improve functional strength, postural alignment, and proper body mechanics for lifting. When performed regularly with precise movement and appropriate progression, dumbbell and barbell drills develop the balanced, functional strength Soldiers need to perform critical tasks against resistance. Attention should be given to conduct exercises properly and safely and form should never be compromised for quantity of repetitions or speed of movement.

Medicine Balls

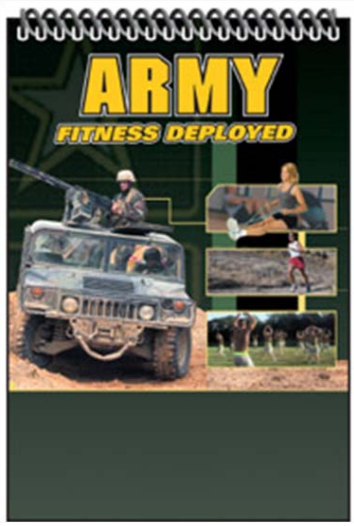
Medicine balls are a versatile piece of equipment that can improve core strength, upper and lower extremity strength and power, control of rotation, dynamic flexibility, and coordination. The recommended weight for Soldiers performing drills should be between 6-12 pounds. Soldiers should not use a medicine ball that is too heavy to maintain proper form. Higher quality medicine balls work best for throwing against a wall or bouncing on the ground. The drills included in this manual offer a variety of training options for individuals or partners. When purchasing equipment, keep in mind that 2-6 Soldiers can share one medicine ball when properly using work/rest ratios and depending on the use of individual or partner drills. Even fewer medicine balls are needed when incorporated at 2-3 stations during circuit training.

Climbing Pods/Pull-up Bars

The purpose of climbing drills is to improve upper body and core strength and the ability to climb and negotiate obstacles. Today's contemporary operating environment requires Soldiers to negotiate walls, fences, and climb rocks and mountainous surfaces. Success in these skills depends on conditioning, strength, and technique. Pull-up bars provide Soldiers with the opportunity to build upper body strength through straight arm pull-ups, pull-ups, alternate grip pull-ups, and flexed arm hang. Core strength can be improved with straight arm pull-ups, heel hooks, and leg tucks. Pull-up bars are readily available on most posts.

Rubber Tubing

Rubber Tubing provides a portable option for strength training. Lengths of 5-6 feet easily fit into ACU cargo pockets and provide a handy tool for use whenever time is available. Resistance bands are available to provide different resistance levels. Shortening the cord or doubling the cord allows you to adjust resistance for different exercises as needed. At some installations, MWR can provide tubing and instruction book sets for units that are scheduled to deploy.



Upper Body Push Exercises

Upper body push exercises can be performed with body weight resistance, machines, barbells, dumbbells, tubing, and medicine balls. The main muscle groups worked are pectorals, triceps, and deltoids. Ensure that a variety of horizontal and vertical exercises are used. The high intensity exercises typically use both extremities in unison and increased weights are lifted. This includes bench press and dips. Lower intensity examples include alternating dumbbell press, overhead press, half knee curl and press, and push-ups.

Strength, Upper Push 1

The Bench Press

Start Position

Count 1

Count 2

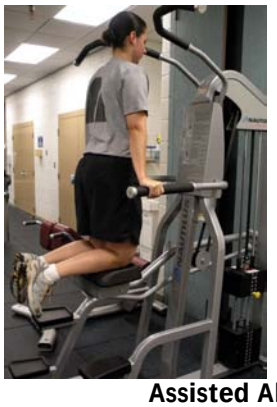
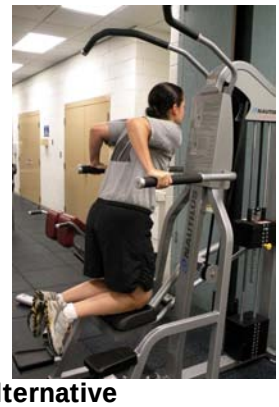
Start Position: Lying on back on bench, neutral arch in spine, feet firmly on floor, weight held firmly above chest, arms straight, brace abdominal muscles.

Count:
1. Bend the elbows and lower barbell until the upper arm and forearm form a 90 degree angle.
2. Return to the starting position in a controlled manner.

Dips



Start Position **Count 1** **Count 2**

Assisted Alternative

Start Position: Using parallel dip bars, arms straight, neutral arch in spine, brace abdominal muscles.

Count: 1. Lower body until upper arms are nearly parallel to the ground. Dipping further can cause injury.

2. Return to the start position.

Alternative Options: If unable to lift full body weight, alternate options include a Gravitron, bench, table, or two chairs.


Bench or Chair Option

Alternating Dumbbell Press



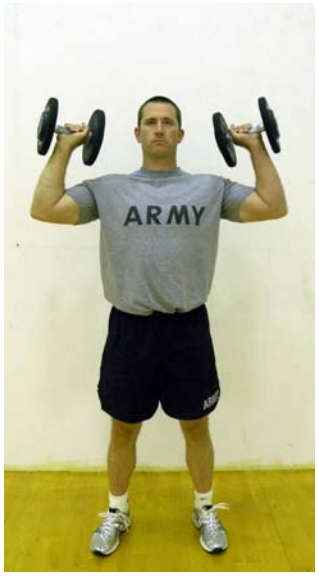
Start Position **Count 1** **Count 2**


Count 3 **Count 4**

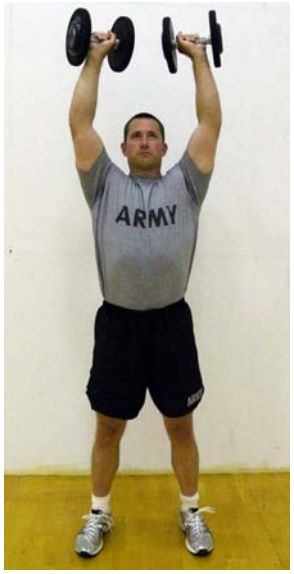
Start Position: Lying on back on bench, neutral arch in spine, feet firmly on floor, weights held in each hand held firmly above chest, arms straight, brace abdominal muscles.

Count:
1. Lower left arm down to parallel in a controlled manner.
2. Return to starting position.
3. Lower right arm down to parallel in a controlled manner.
4. Return to starting position.

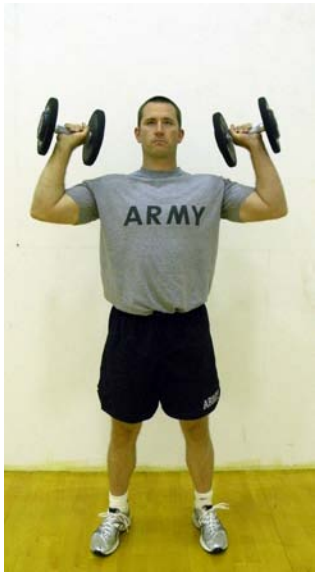
Overhead Press



Start Position



Count 1



Count 2

Start Position: Regular stance, neutral arch in spine, hands at shoulder height with weights, brace abdominal muscles.

Count:
1. Raise weights overhead by extending the elbows.
2. Return to the starting position in a controlled manner.

Half Kneel Curl & Press


Start Position


Count 1


Count 2


Count 3


Count 4

Start Position: Half kneeling position with slight forward lean, neutral arch in spine, arms at side, weights in hands, brace abdominal muscles.

Count:
1. Curl the weights to the shoulders by bending the elbows (curl position).
2. Press the weights overhead while rotating the wrists forward.
3. Lower the weights to the curl position.
4. Return to the starting position in a controlled manner.

Push-Ups


Start Position


Count 1


Count 2


Count 3


Count 4

Start Position: Perform a squat thrust to move into the front leaning rest, maintaining the body straight from head to heels. Body weight is supported on the hands and balls of the feet.

Count:
1. Bend the elbows, lowering the body until the upper arms are parallel with the ground.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

Upper Body Pull Exercises

Upper body pull exercises can be performed with body weight resistance, machines, barbells, dumbbells, tubing, and medicine balls. The main muscle groups worked are lats, biceps, rhomboids, and deltoids. Ensure that a variety of horizontal and vertical exercises are used. The high intensity exercises typically use both extremities in unison and increased weights are lifted. This includes pull-ups and upright rows. Lower intensity examples include double arm snatch, bent-over rows, standing curl, and lat pull-down.

Strength, Upper Pull 1

Pull-Ups

Start & Count 2 **Count1**
Overhand Grip

Start & Count 2 **Count 1**
Underhand Grip

Start & Count 2 **Count 1**
Assisted Alternative

Start Position: Using pull-up bar with spotter, arms straight, hands gripped on bar, legs off ground, neutral arch in spine, brace abdominal muscles.

Count:
1. Pull the body up until the chin is over the bar.
2. Return to the starting position in a controlled manner.

Equipment such as the Gravitron will help Soldiers who are unable to lift their entire body weight. See fitness personnel or therapist for proper use of equipment.

Upright Row


Start Position


Count 1


Count 2

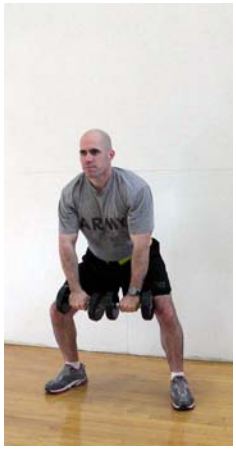
Start Position: Straddle stance with dumbbells or barbell to the front of the thigh, arms straight, neutral arch in spine, knees slightly flexed, trunk leaning slightly forward, brace abdominal and back muscles.

Count:
1. Bend the elbows while raising arms to side, parallel with shoulders.
2. Return to the starting position.

Double Arm Snatch


Start Position


Count 1


Count 2

Start Position: Regular stance with arms down in front, weights side by side, neutral arch in spine, brace abdominal and back muscles. Do not use heavy weights for this exercise, it is designed to train explosive power.

Count:
1. Initiate movement using a forceful upward pull with the arms and a simultaneous jump with feet. End with arms overhead.
2. Return to the starting position.

Bent-over Row


Start Position


Count 1


Count 2

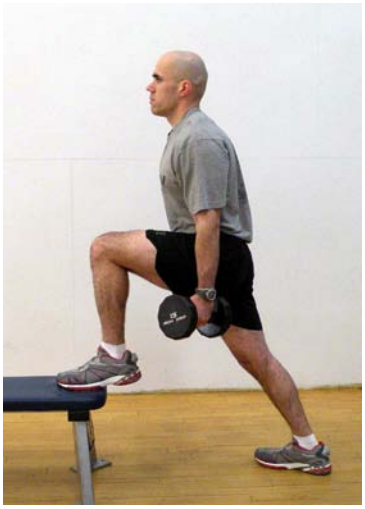
Start Position: Straddle stance with dumbbells or barbell to the front of the thigh, arms straight, neutral arch in spine, knees slightly flexed, trunk leaning slightly forward, brace abdominal and back muscles.

Count:
1. Bend the elbows while raising arms to side, parallel with shoulders.
2. Return to the starting position.

Standing Curl


Start Position


Count 1


Count 2

Start Position: Stand with one foot on bench, slight forward lean, neutral arch in spine, arms straight, weights in hands, brace abdominal and back muscles.

Count:
1. Bend elbow, bringing weights to shoulder level in a controlled manner.
2. Return to the starting position.

Lat Pull Down

Start Position

Count 1

Count 2

Start Position: Using lat pull down machine in gym, sitting with neutral arch in spine, arms extended overhead, hands gripping bar, brace abdominal and back muscles.

Count:
1. Pinch shoulder blades together, bend the elbows and pull the bar to the upper chest.
2. Return to the starting position in a controlled manner.

Lower Body Push Exercises

Lower body push exercises can be performed with body weight resistance, machines, barbells, dumbbells, tubing, and medicine balls. The main muscle groups worked are quadriceps and gluteals. Ensure that a variety of horizontal and vertical exercises are used. The high intensity exercises typically use both extremities in unison and increased weights are lifted. This includes squats and lunges. Lower intensity examples include the single leg squat, Iron Mike, forward squat with 1 & 2 arm up, and leg press.

Strength, Lower Push 1

Front Squat

Start Position

Count 1

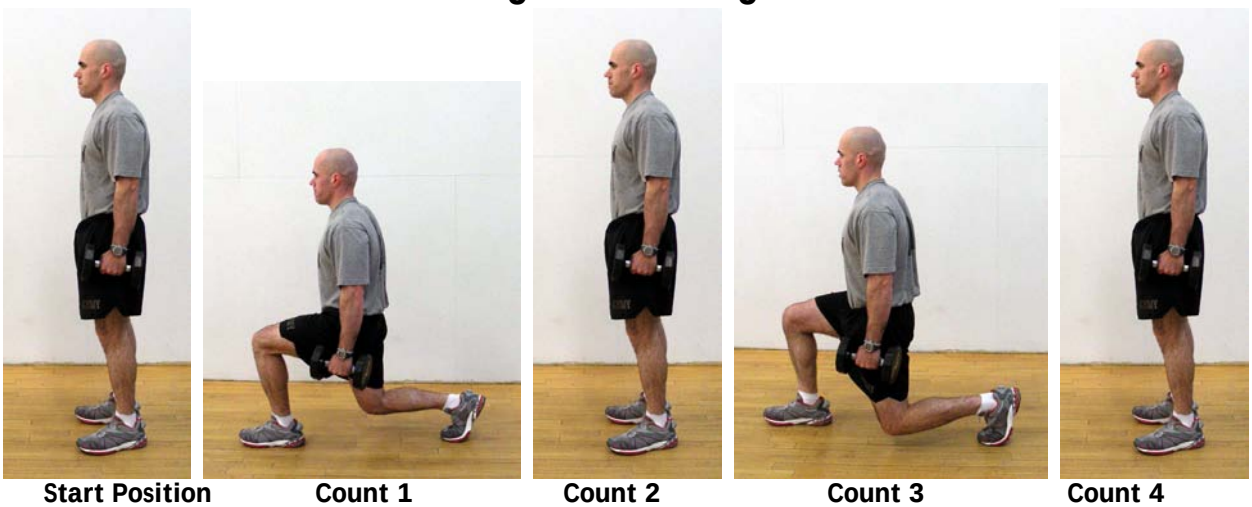
Count 2

Start Position: Straddle stance with barbell on front of shoulders, arms elevated to balance barbell, elbows bent with hands touching barbell, neutral arch in spine, brace abdominal and back muscles.

Count:
1. Squat while leaning slightly forward at the waist with the head up and back straight. If the back begins to round or heels come off the ground, do not continue to squat any deeper. Do not squat lower than thighs parallel to the ground.
2. Return to the starting position in a controlled manner.

A back squat can also be performed with the barbell resting behind the neck on the upper back. Extra caution should be taken to ensure the back does not round.

Lunge with weights



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Start Position: Regular stance with weights at the side, arms straight, neutral arch in spine, brace abdominal muscles.

Count:
1. Lower the body by stepping to the front with the left leg, bearing the body weight mostly on the forward leg.
2. Return to the starting position.
3. Repeat count one with the right leg.
4. Return to the starting position.

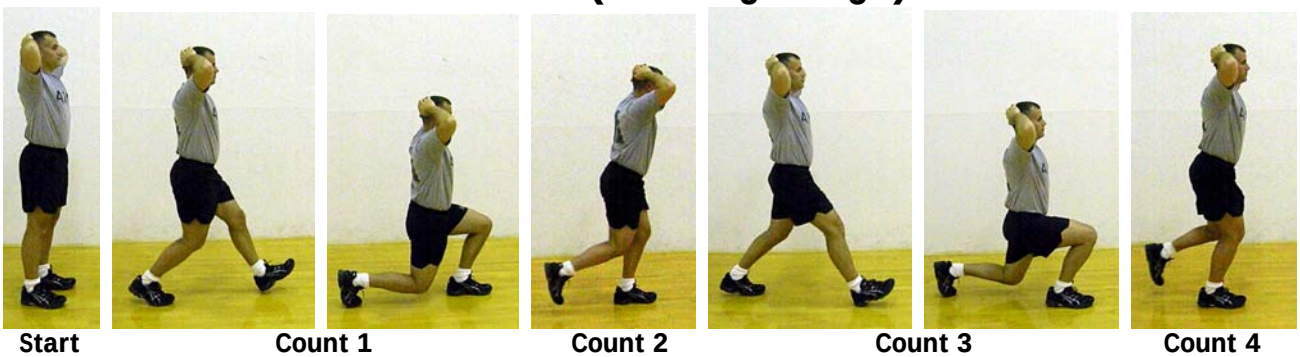
Single Leg Squat

Start Position | Count 1 | Count 2

Start Position: Stand with bench to rear, one leg slightly lifted off floor, neutral arch in spine, brace abdominal and back muscles.

Count:
1. Squat on one leg while leaning slightly forward at the waist with the head up and back straight. If the back begins to round or the heels come off the ground, do not continue to squat any deeper. Do not squat lower than thighs parallel to the ground. Touch the bench or chair if possible.
2. Return to the starting position in a controlled manner.

Iron Mike (Walking Lunge)



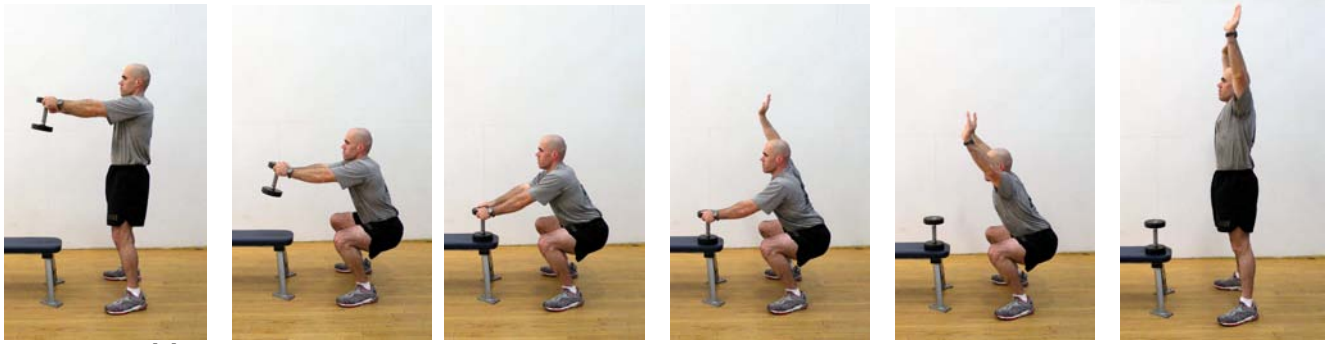
Start | Count 1 | Count 2 | Count 3 | Count 4

Start Position: Regular stance with arms clasped on head, neutral arch in spine, brace abdominal muscles.

Count:

1. Lower the body by stepping forward with the left leg, tilting the straight trunk slightly forward, bearing the body weight on the bent left leg, allow the right knee to slightly touch the ground.
2. Step forward and through with the right leg.
3. Repeat count one with the right leg.
4. Continue for specified distance, return to the starting position at end.

Forward squat with 1 & 2 arm up



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Start Position: Regular stance with arms held at shoulder level, dumbbell held in both hands, neutral arch in spine, brace abdominal muscles.

Count:

1. Squat while leaning slightly forward at the waist with the head up and back straight, keeping the arms at shoulder level, gently place dumbbell on bench.
2. Remain in squatted position, raise right arm straight upward.
3. Remain in squatted position, raise left arm straight upward.
4. Stand upright keeping arms overhead.

Leg Press


Start Position


Count 1


Count 2

Start Position: Using leg press machine at gym, sit with knees straight but not locked, feet flat on foot platform, neutral arch in spine, brace abdominal muscles.

Count:
1. Bend knees to 90 degrees in a controlled manner.
2. Return to the starting position in a controlled manner without locking knees.

Lower Body Pull Exercises

Lower body pull exercises can be performed with body weight resistance, machines, barbells, dumbbells, tubing, and physioballs. The main muscle groups worked are hamstrings, gluteals, and calf. Ensure that a variety of horizontal and vertical exercises are used. The high intensity exercises typically use both extremities in unison and increased weights are lifted. This includes the dead lift. Lower intensity examples include hamstring curl with physioball, single leg Romanian dead lift, hamstring curl sitting and prone, hip extensions with weights, and calf raises.

Strength, Lower Pull 1

Dead Lift

Start Position

Count 1

Count 2

Start Position: Straddle stance, neutral arch in spine, knees bent to allow hands an overhand grip or alternating grip on barbell, heels on the floor ,brace abdominal and back muscles.

Count:

1. Raise the barbell from the floor while maintaining a neutral spine, slowly extending the knees while going up. Finish by standing upright, not extended backward.
2. Return to the starting position in a controlled manner while keeping a neutral arch in spine. Do not allow the back to round or heels to come off the floor.

Hamstring Curl with Physioball


Start Position


Count 1


Count 2

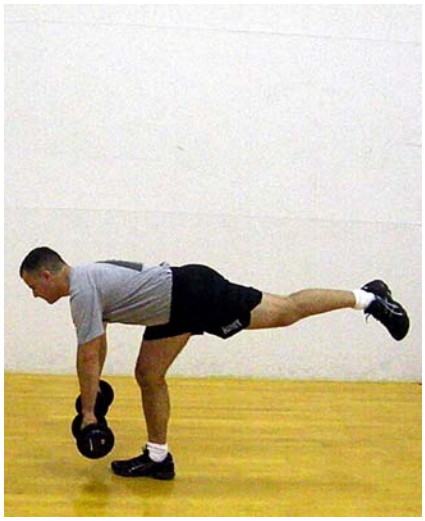
Start Position: Using physioball on the floor, lying on back, feet balanced on ball, legs extended, shoulders on ground, arms at side, brace abdominal and back/hip muscles.

Count:
1. Curl legs toward back, bringing knees up and rolling feet on ball. Keep the shoulder blades on the floor to protect the neck. Ensure core muscles brace to maintain balance on the physioball.
2. Return to the starting position in a controlled manner.

Single Leg Romanian Dead Lift


Start Position


Count 1


Count 2

Start Position: Regular stance with weights at the side, arms straight, neutral arch in spine, brace abdominal and back muscles.

Count:
1. Lean forward while balancing on one leg and raising the other leg behind, allow the arms to move forward keeping perpendicular to the ground, keep a neutral arch in the spine.
2. Return to the starting position in a controlled manner.

Hamstring Curl – Sitting

Start Position **Count 1** **Count 2**

Start Position: Using hamstring curl machine at gym, sit with back against seat, legs extended, pad against calf, neutral arch in spine, brace abdominal muscles.

Count:
1. Lower/curl legs to the rear until knees flexed to 90 degrees.
2. Return to the starting position in a controlled manner.

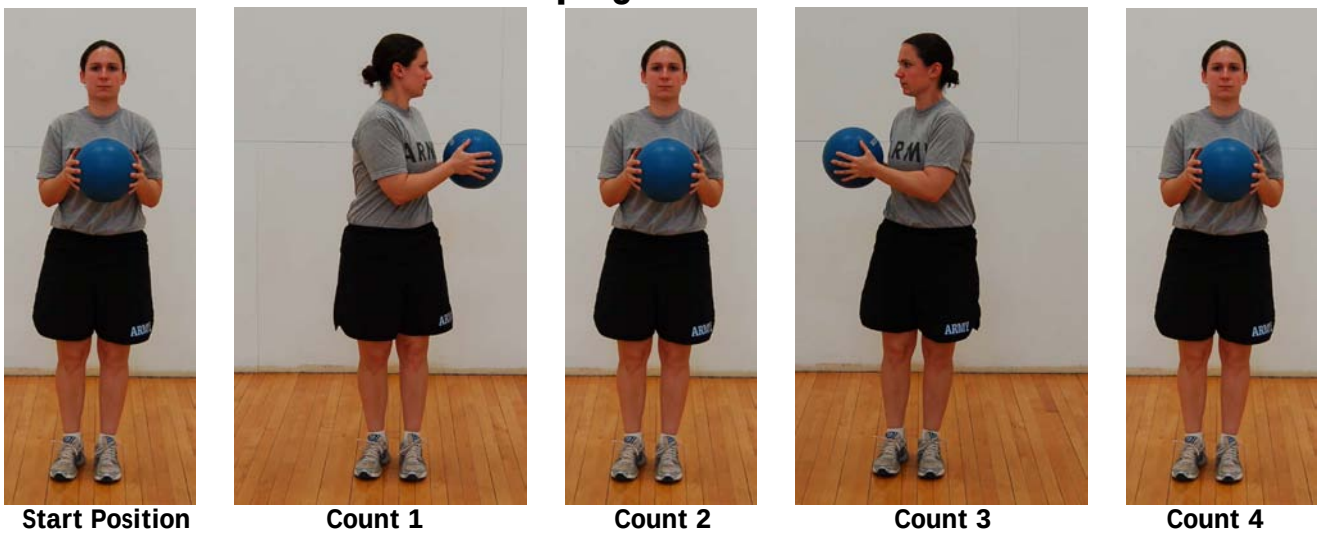
Hamstring Curl – Prone

Start Position **Count 1** **Count 2**

Start Position: Using hamstring curl machine at gym, lying on bench with pad resting on back of ankles, legs extended, neutral arch in spine, brace abdominal muscles.

Count:
1. Curl legs to the rear until knees flexed to 90 degrees.
2. Return to the starting position in a controlled manner.

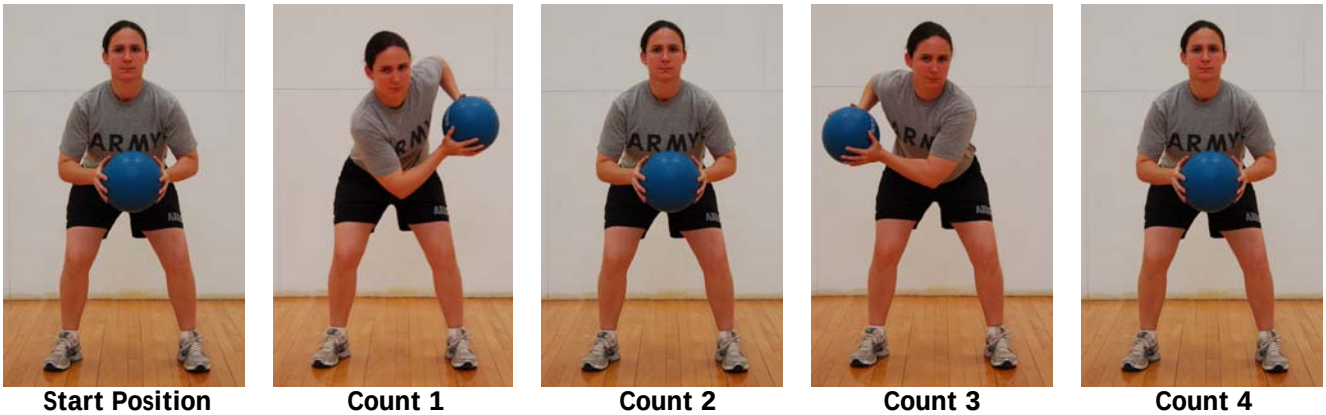
Upright Twist



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.
Start Position: Regular stance, holding the medicine ball in front of the abdomen.
Count:
1. Rotate the torso to the left, maintaining the position of the medicine ball at the abdomen and keeping the head in line with the chest.
2. Return to the starting position.
3. Repeat count one to the right.
4. Return to the starting position.

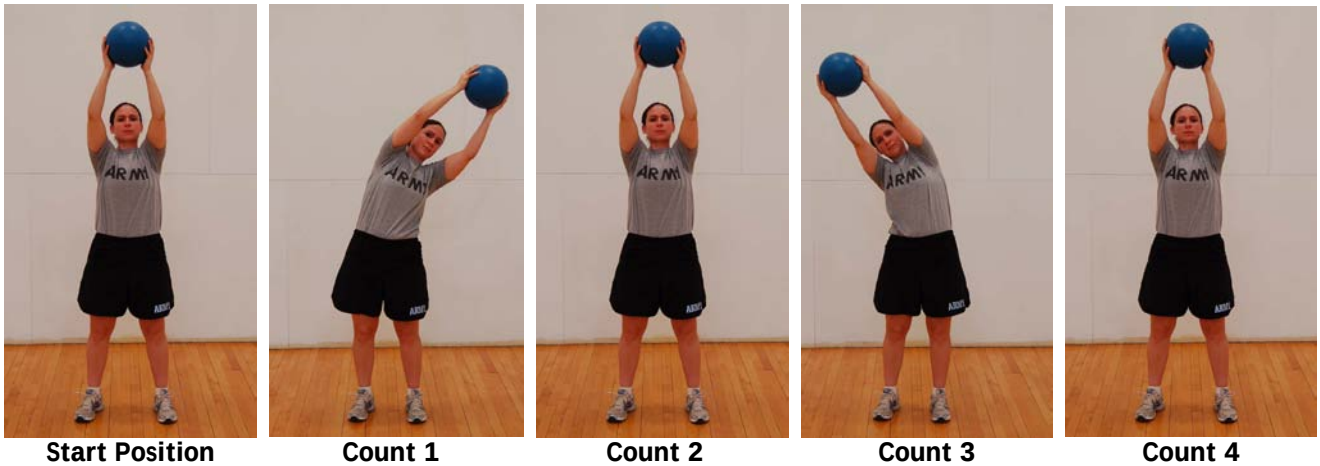
Bent-over Twist



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.
Start Position: Forward leaning with the feet 1 ½ shoulder widths apart, toes pointed out 45 degrees and knees slightly bent, holding the medicine ball in front of the abdomen.
Count:
1. Rotate the torso, moving the medicine ball to the left side of the torso and maintaining the starting position with the lower body.
2. Return to the starting position.
3. Repeat count one to the right.
4. Return to the starting position.

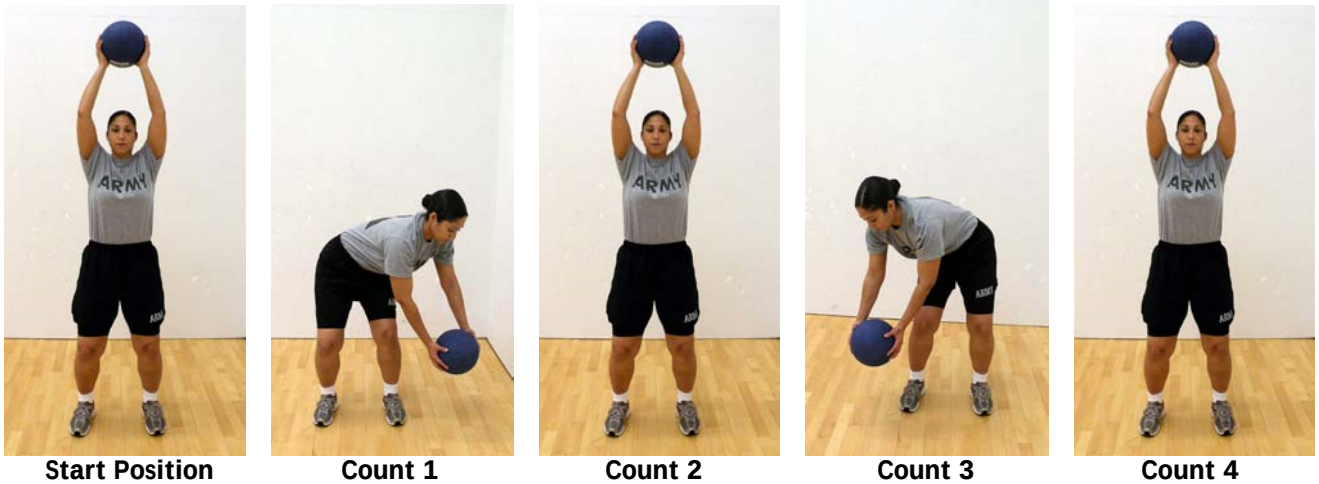
Overhead Side Bender



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow.
Start Position: Arms overhead, holding the medicine ball.
Count:
1. Lean sideways to the left, maintaining the overhead position of the medicine ball.
2. Return to the starting position.
3. Repeat count one to the right.
4. Return to the starting position.

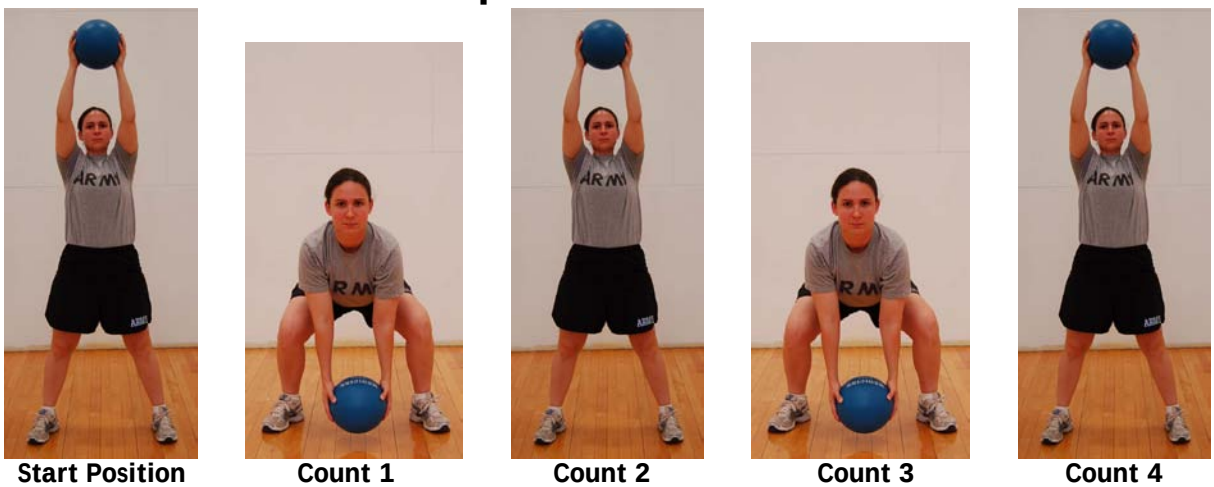
Overhead Turn and Bend



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow with abdominal bracing.
Start Position: Arms overhead, holding the medicine ball, knees slightly bent.
Count:
1. Rotate to the left, lowering the medicine ball to the outside of the left knee while keeping the arms fully extended.
2. Return to the starting position.
3. Repeat count one to the right.
4. Return to the starting position.

Squat and Reach

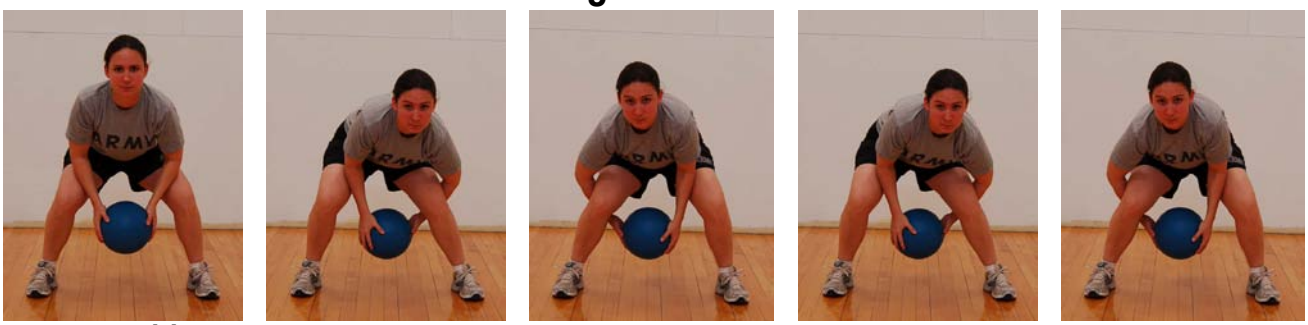


Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow with abdominal bracing.
Start Position: Arms overhead, holding the medicine ball, with the feet 1 ½ shoulder widths apart and the toes pointed out 45 degrees.
Count:

1. Squat and bend forward, reaching between the legs with the medicine ball. Ensure the lower back maintains a neutral position.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

Leg Weaver



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.
Start Position: Forward leaning, holding the medicine ball with your feet 1 ½ shoulder widths apart and the toes pointed out 45 degrees.
Count:

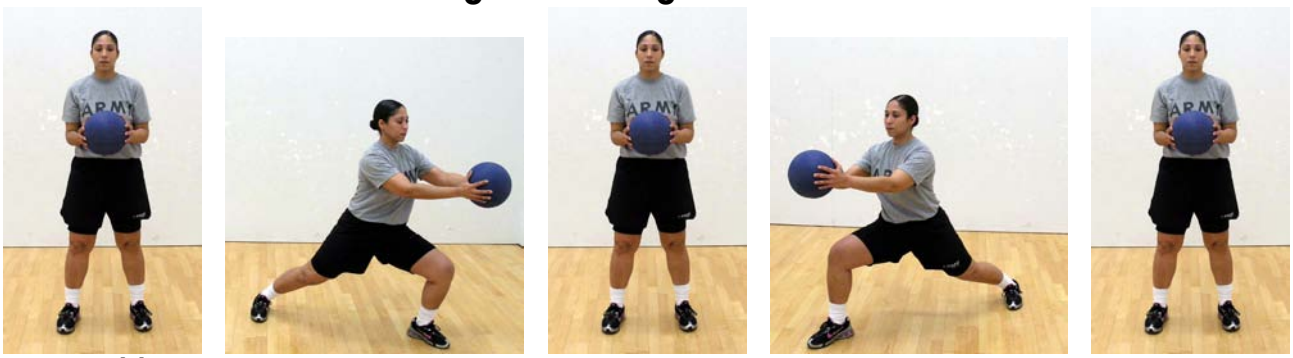
1. Keeping the arms extended, lean to the left, pass ball right hand to left hand, behind the left leg.
2. Reverse the direction, lean to the right, pass ball left hand to the right hand, behind the right leg.
3. Repeat count one.
4. Repeat count two (return to the starting position at the end of desired repetitions/time).

Rear Lunge and Press

Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow with abdominal bracing.
Start Position: Regular stance, holding the medicine ball in front of the abdomen.
Count:
1. Step straight back with the left foot, performing a rear lunge and simultaneously pressing the medicine ball overhead.
2. Return to the starting position.
3. Repeat count one with the right foot.
4. Return to the starting position.

Diagonal Lunge and Push

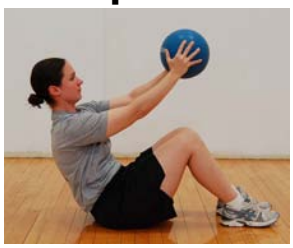


Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow with abdominal bracing.
Start Position: Regular stance, holding the medicine ball in front of the abdomen.
Count:
1. Step diagonally with the left, performing a lunge at 45 degrees and simultaneously pushing the medicine ball away from the abdomen.
2. Return to the starting position.
3. Repeat count one to the right side.
4. Return to the starting position.

Sit-up and Reach


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow with abdominal bracing.
Start Position: Position on back, feet flat on the ground, knees bent at 90 degrees, neutral arch in spine, holding the medicine ball in front of the abdomen.
Count:
1. Perform a sit-up and simultaneously reach up and forward.
2. Return to the starting position.
3. Repeat count one.
4. Return to the starting position.

Side to Side Tap


Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow with abdominal bracing.
Start Position: Assume the up position of the sit-up, neutral arch in spine, holding the medicine ball in front of the abdomen.
Count:
1. Rotate the torso to the left and touch the medicine ball to the ground.
2. Return to the starting position.
3. Repeat count one to the right side.
4. Return to the starting position.

Underhand Toss and Catch

Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.
Start Position: Forward leaning with the feet 1½ shoulder widths apart, toes pointed out 45 degrees, squat knees, holding the medicine ball below the waist, with arms extended.
Count:

1. Stand up on the balls of the feet and simultaneously rise with the arms overhead, tossing the medicine ball three to five feet overhead.
2. Catch the medicine ball overhead and return to the starting position.
3. Repeat count one.
4. Repeat count two.

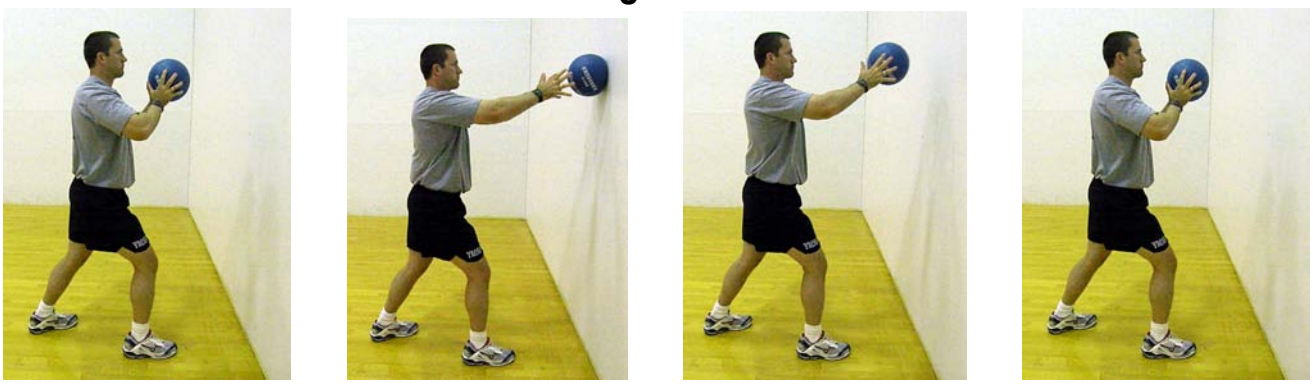
Overhead Toss and Catch

Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.
Start Position: Arms overhead, holding the medicine ball, elbows slightly bent.
Count:

1. Extend the elbows to toss the medicine ball two to three feet overhead.
2. Catch the medicine ball, slightly bending the elbows and return to the starting position.
3. Repeat count one.
4. Repeat count two.

Short Range Chest Toss



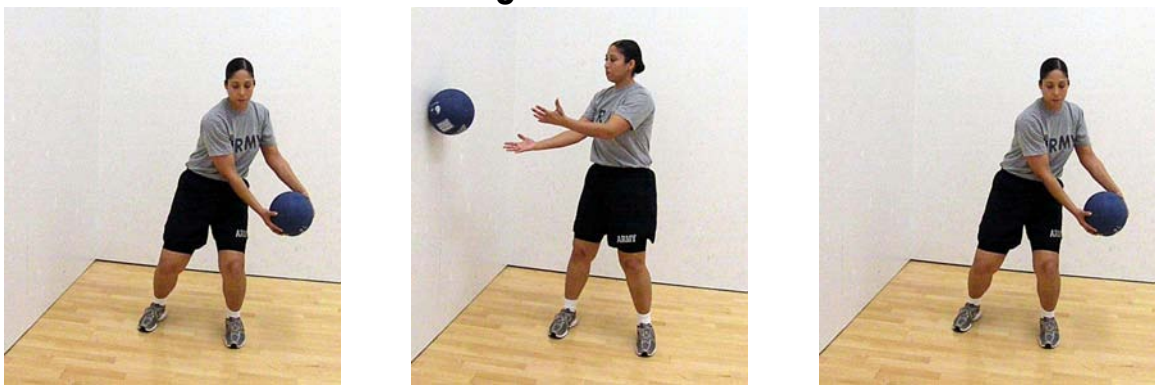
Cadence: Fast with abdominal bracing.
Start Position: Regular stance, knees comfortably bent, holding the medicine ball in front of the abdomen. Stand 2-3 feet away from a solid wall.
Exercise: Extend the elbows to throw the medicine ball against the wall at chest height. Catch the medicine ball and immediately repeat the action. Use the first few throws to warm up and get a rhythm, then continue the exercise for 20-30 seconds with a maximal intensity. This is meant to be a quick-reaction drill. Perform 2-3 sets. For more stability, move one foot forward and the other back.

Short Range Overhead Toss – One Leg Stance

Cadence: Fast with abdominal bracing.
Start Position: Staggered stance, one leg forward about 1 foot away from a solid wall. Knees comfortably bent or in a lunge position with arms overhead, holding medicine ball.
Exercise: Throw the medicine ball against the wall overhead. Catch the medicine ball and immediately repeat the action. Use the first few throws to warm up and get a rhythm, then continue the exercise for 20-30 seconds with a maximal intensity. Perform 2-3 sets.

Medicine Ball Drill 1, Exercise 15

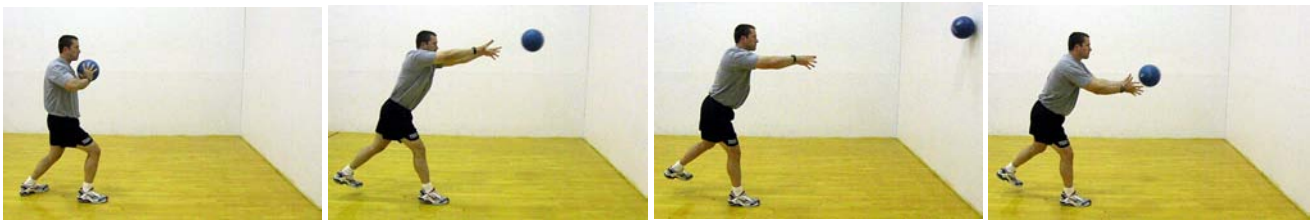
Short Range Rotational Toss



Cadence: Fast with abdominal bracing.
Start Position: Regular stance, knees comfortably bent, standing sideways and about 2-3 feet away from a solid wall. Hold the medicine ball to the side away from the wall.
Exercise: Rotate the trunk and throw the medicine ball against the wall at abdomen height. Catch the medicine ball and immediately repeat the action. Use the first few throws to warm up and get a rhythm, then continue the exercise for 20-30 seconds with a maximal intensity. The power for the throw should come from the trunk. Perform a second repetition to the other side. Perform 2-3 sets.

Medicine Ball Drill 1, Exercise 16

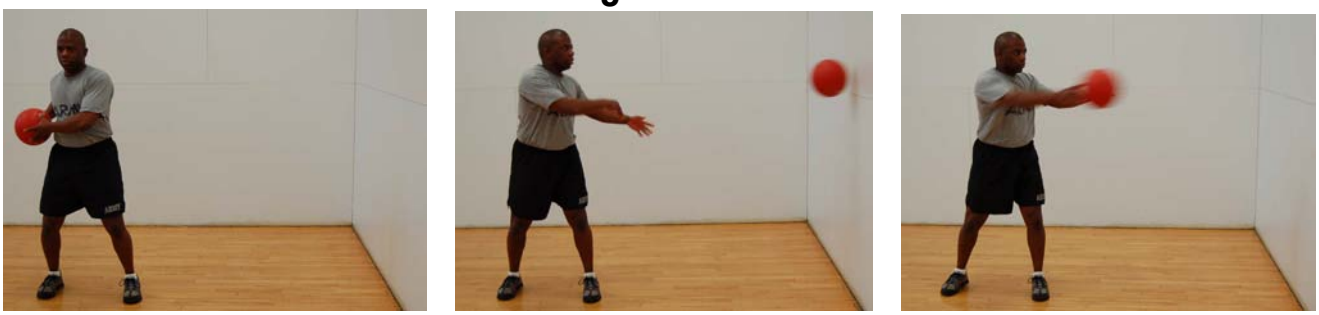
Medium Range Chest Toss



Cadence: Moderate with abdominal bracing.
Start Position: Regular stance, knees comfortably bent, holding the medicine ball in front of the abdomen. Stand 8-10 feet away from a solid wall.
Exercise: Extend the elbows to throw the medicine ball against the wall at chest height. Catch the medicine ball and reset your start position. Repeat the action using explosive throws. This exercise will be at a slower cadence than the short range exercises and is designed to build power. Continue for 30 seconds to one minute. Rest briefly (about 20 seconds) before the next exercise.

Medicine Ball Drill 1, Exercise 17

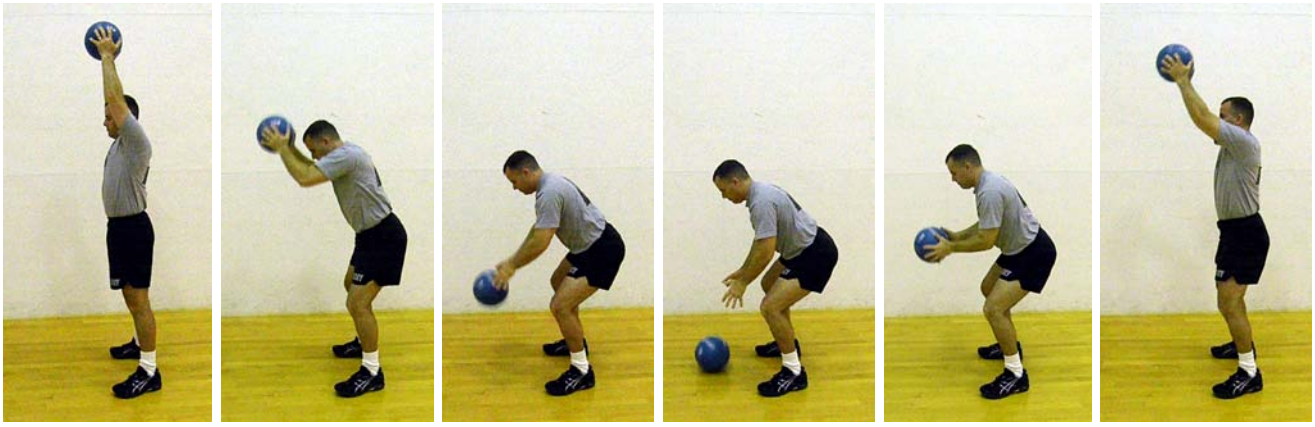
Medium Range Rotational Toss



Cadence: Fast with abdominal bracing.
Start Position: Regular stance, knees comfortably bent, standing sideways and about 6-8 feet away from a solid wall. Hold the medicine ball to the side away from the wall.
Exercise: Rotate the trunk and throw the medicine ball against the wall at abdomen height. Catch the medicine ball and rotate away to absorb the force of the rebound. Use your legs to help you slow the catch and then repeat the throw using your legs and trunk to improve the explosiveness of your throw. Continue for 30 seconds to one minute.

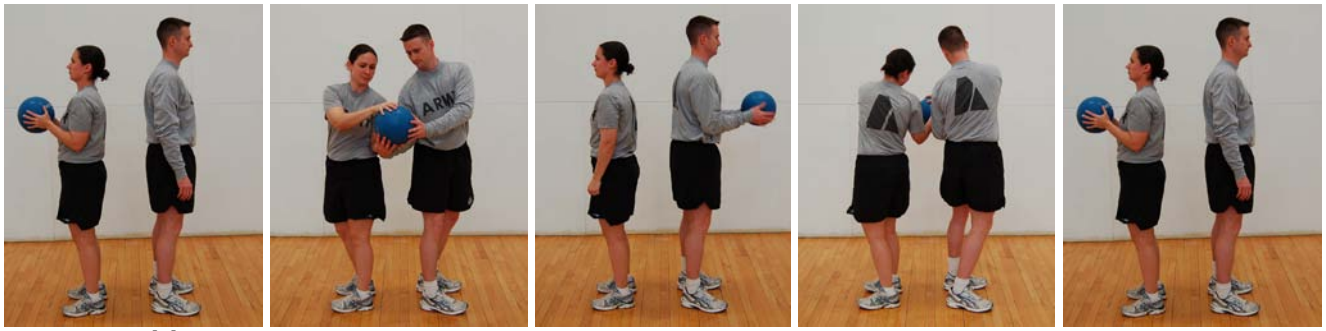
Medicine Ball Drill 1, Exercise 18

Ball Buster



Cadence: Fast with abdominal bracing.
Start Position: Standing on a hard surface, regular stance, knees slightly bent, holding medicine ball overhead.
Exercise: Pull the medicine ball forcefully to the ground while squatting downward with the legs. Slam the medicine ball into the ground and perform a quick reaction catch. Bring the medicine ball back overhead and continue motion repetitively for 30-45 seconds. Perform 2-3 sets.

Outside Rotation Pass



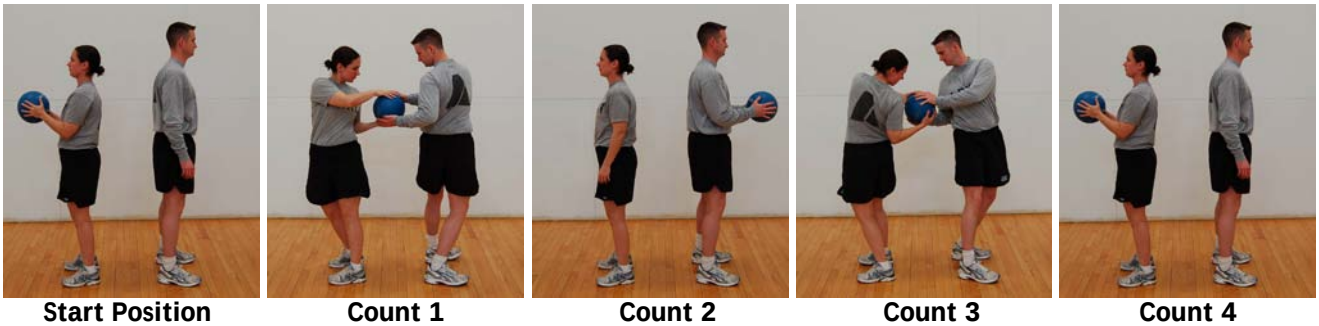
Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.
Start Position: Regular stance, holding the medicine ball in front of the abdomen, with your back to your partner. Partner stands in the same position, 2-3 feet away, without the medicine ball.
Count:

1. Rotate to the left (partner rotates to the right), while extending the arms forward at chest level and hand the medicine ball to your partner.
2. Partner receives the medicine ball and both return to the starting position.
3. Repeat count one with the partner handing off the medicine ball to the opposite side.
4. Rotate to the starting position.

Note: Repeat the drill in the opposite direction.

Inside Rotation Pass



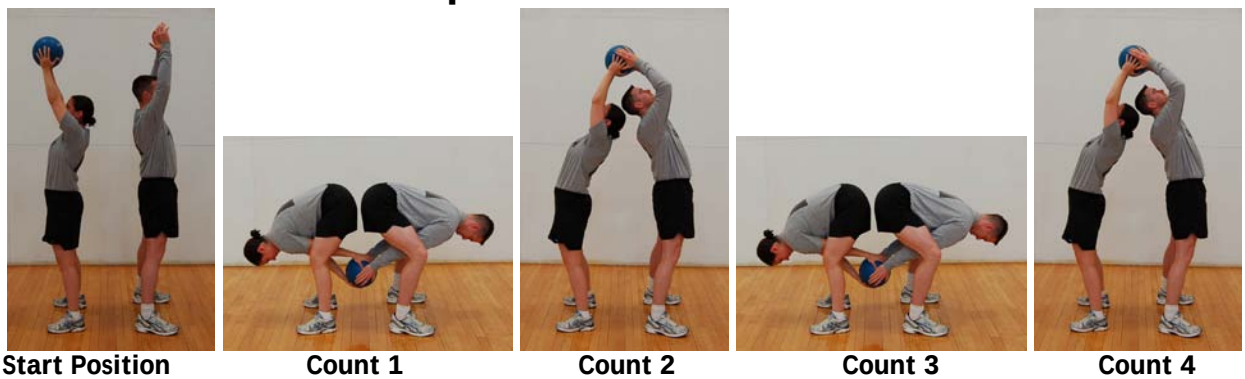
Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.
Start Position: Regular stance, holding the medicine ball in front of the abdomen, with your back to your partner. Partner stands in the same position, 2-3 feet away, without the medicine ball.
Count:

1. Rotate to the left (partner rotates to the left), while extending the arms forward at chest level and hand the medicine ball to your partner.
2. Partner receives the medicine ball and both return to the starting position.
3. Repeat count one with the partner handing off the medicine ball to the opposite side.
4. Rotate to the starting position.

Note: Repeat the drill in the opposite direction.

Squat and Reach Pass



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.

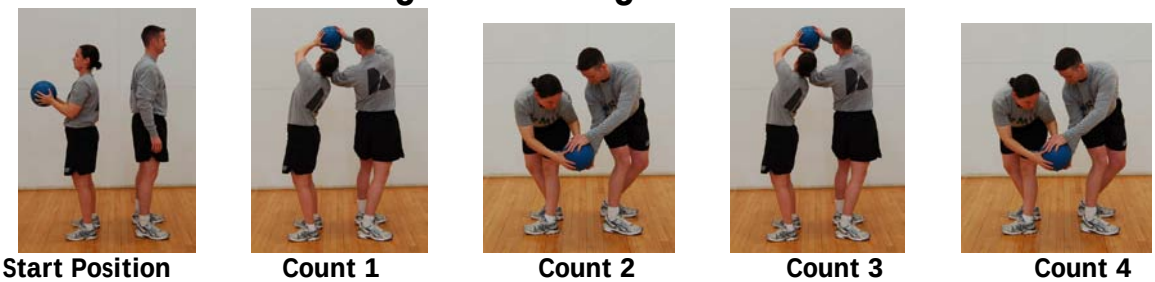
Start Position: Arms overhead, holding the medicine ball, with your feet 1 ½ shoulder widths apart and your back to your partner. Partner stands in the same position, two to three feet away, without the medicine ball.

Count:

1. Squat and bend forward (partner performs the same action), reaching between the legs and hand off the medicine ball to your partner.
2. Partner receives the medicine ball and both return to the starting position and hand off the medicine ball overhead.
3. Exerciser receives the medicine ball and both repeat count one.
4. Partner receives the medicine ball and both repeat count two or return to the starting position if performing the last repetition.

Note: Repeat the drill with the partner starting with the medicine ball (opposite direction).

High-Low Diagonal Pass



Start Position | Count 1 | Count 2 | Count 3 | Count 4

Cadence: Slow/moderate with abdominal bracing.

Start Position: Regular stance, holding the medicine ball in front of the abdomen, with your back to your partner. Partner stands in the same position, 2-3 feet away.

Count:

1. Extend your arms upward and over the left shoulder (partner performs the same action to the right), handing off the medicine ball to your partner.
2. Partner receives the medicine ball and extends arms downward toward the left knee (exerciser performs the same movement toward the right knee) and hands off the medicine ball to the exerciser.
3. Exerciser receives the medicine ball and both repeat count one.
4. Partner receives the medicine ball and both repeat count two or return to the starting position if performing the last repetition.

Note: This drill can be repeated in the reverse direction, over the other shoulder, and the reverse direction over the other shoulder.

Sit-up and Reach Pass


Start Position


Count 1


Count 2


Count 3


Count 4

Cadence: Slow with abdominal bracing.
Start Position: Position on back, feet interlocked, knees bent at 90 degrees, holding the medicine ball in front of the abdomen. Exerciser and partner will mirror movements.
Count:
1. Perform a sit-up and simultaneously reach up and forward, extending the arms. Hand off the medicine ball to your partner.
2. Return to the starting position.
3. Repeat count one with the partner passing the medicine ball to the exerciser.
4. Repeat count two.

Prone Extension


Start Position, Count 2, and Count 4


Count 1 and Count 3

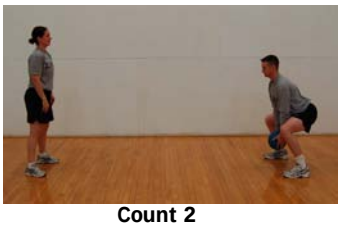
Cadence: Slow with abdominal bracing.
Start Position: Lie prone on the ground, legs together, and arms extended overhead. Exerciser and partner mirror each other's position, holding the finger tips under the medicine ball between their outstretched arms. Avoid excessive extension of the neck.
Count:
1. Both partners lift the medicine ball 6-8 inches up, hold 2-3 seconds.
2. Return to the starting position.
3. Repeat count one.
4. Repeat count two.

Note: The intensity of this exercise is increased by simultaneously raising the feet and legs off the ground while lifting the medicine ball. The partners can also move further apart.

Underhand Pass


Start Position


Count 1


Count 2


Count 3


Count 4

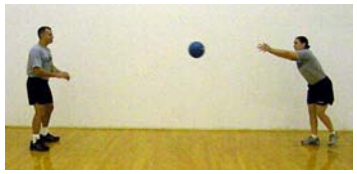
Cadence: Slow/moderate with abdominal bracing.
Start Position: Forward leaning with the feet 1½ shoulder widths apart, toes pointed out 45 degrees, squat knees, holding the medicine ball below the waist, with arms extended. Partner is standing upright with arms in front of abdomen.
Count:

1. Stand up on the balls of the feet and simultaneously rise with the arms overhead, tossing the medicine ball in a high arc to your partner.
2. Partner catches the medicine ball and immediately tosses the medicine ball back to the exerciser using the same form.
3. The exerciser catches the medicine ball and repeats count one.
4. Repeat count two, on the last repetition both return to the start position.

Rotation Pass


Start Position


Count 1 & 3


Count 2 & 4

Cadence: Moderate with abdominal bracing.
Start Position: Regular stance, holding the medicine ball in front of the abdomen. Partner stands between 3-5 yards away, without the medicine ball, facing the exerciser.
Count:

1 & 3. Turn to the left with arms extended, then step up and throw the ball in a sideward motion to your partner's left side.
2 & 4. Partner catches the medicine ball and immediately repeats the action back to the exerciser. On last repetition, both return to start position.

This drill can be repeated to the right side.

Medicine Ball Drill 2, Exercise 9

Chest Pass

Start Position

Count 1 & 3

Count 2 & 4

Cadence: Moderate with abdominal bracing.
Start Position: Regular stance, holding the medicine ball in front of the abdomen. Partner stands between 3-5 yards away, without the medicine ball, facing the exerciser.
Count:

1. Step forward with one foot and extend the elbows to throw the medicine ball to your partner at chest height, then return to the starting position.
2. Partner catches the medicine ball, slightly bending knees and elbows and immediately repeats the action performed by the exerciser in count one.
3. The exerciser catches the medicine ball and immediately repeats the actions in count one.
4. Repeat the actions in count two until desired number of repetitions.

Medicine Ball Drill 2, Exercise 10

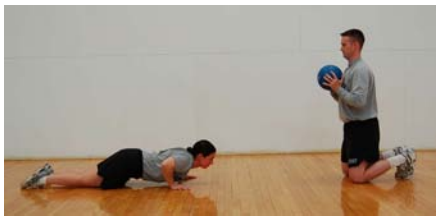
Chest Pass and Shuffle

*** See above photos with modifications below***

Cadence: Moderate with abdominal bracing.
Start Position: Regular stance, holding the medicine ball in front of the abdomen. Partner stands between 3-5 yards away, without the medicine ball, facing the exerciser.
Exercise: Throw the medicine ball back and forth with your partner at chest height, while both of you shuffle sideways for 10-20 yards. Repeat in the opposition direction back to the starting point. Repeat for the desired number of repetitions.

Push-up Pass


Start Position


Count 1 & 3


Count 2 & 4

Cadence: Moderate with abdominal bracing.
Start Position: Kneel (preferably on grass or mat), holding the medicine ball in front of the chest, facing your partner. Partner kneels in the same position, 2-3 yards away.
Count:

1. Perform a chest throw to your partner from the kneeling position, then immediately fall forward and perform a kneeling push-up.
2. Partner catches the medicine ball and times the return chest throw as the exerciser is coming upright.
3. Exerciser catches the ball and repeats count one with proper timing.
4. Repeat the actions in count two, return to start position after last repetition.

Overhead Pass


Start Position


Count 1


Count 2

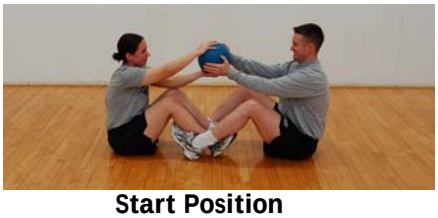

Count 3

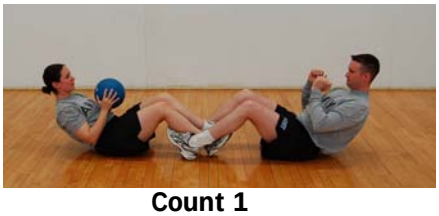

Count 4

Cadence: Moderate with abdominal bracing.
Start Position: Arms overhead, holding the medicine ball, facing your partner. Partner stands in the same position, 2-3 yards away, without the medicine ball.
Count:

1. Step forward and extend your elbows to throw the medicine ball one to two feet above your partner's head, then return to the starting position.
2. Partner catches the medicine ball, slightly bending the knees and elbows and immediately repeats the action performed by the exerciser.
3. The exerciser catches the medicine ball and repeats count one.
4. Repeat count two, return to starting position on last repetition.

5-Count Partner Sit-Up


Start Position

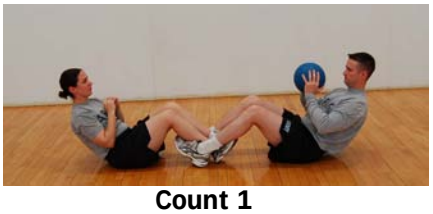

Count 1


Count 2


Count 3


Count 4


Count 5


Count 1


Count 2


Count 3


Count 4


Count 5

Cadence: Slow with abdominal bracing.
Start Position: Start in the sit-up position holding the medicine ball between both partners. Partners will interlock feet and mirror movements throughout the exercise.
Count:

1. Both partners lower down halfway, one holding the medicine ball, the other holding hands in front of the chest.
2. Maintaining the halfway position, rotate the trunk to one side to tap the elbow to the ground.
3. Rotate the trunk to the other side and tap the other elbow to the ground.
4. Return to the halfway point and lower all the way down.
5. Sit-up to the start position to pass the ball to the partner.

Note: Repeat the exercise with the other partner holding the medicine ball. Continue for the desired number of repetitions.

Anaerobic Endurance Training

To enhance our combat effectiveness and survivability Soldiers must train to perform highly intense, short duration activities with great efficiency for any number of repetitions. Think about sprinting from cover to cover while under fire. To minimize risk, Soldiers must develop the strength, coordination, and speed to get from a fighting position, to a sprint, and back to a fighting position in the most efficient means possible. Soldiers don't suddenly develop this ability when they are in a bad situation, they hone this skill while in garrison and during pre-deployment exercises.

Anaerobic endurance events involve a period of high-intensity exercise balanced by periods of less intense exercise or rest. Examples of anaerobic endurance training are interval running, fast continuous runs, speed and agility drills, grass and guerrilla drills, individual movement techniques, combatives, and negotiating obstacles.

In order to avoid injury and maximize the training effect, Soldiers must ensure an adequate recovery period between bouts of intense exercise. Soldiers who perform continuous high-demand, high-intensity movement drills, will fatigue and resort to sloppy movement which increases their risk for injury. A good initial work/rest ratio is 1:2. You can progress to a 1:1 work/rest ratio as you progress to a phase closer to deployment.

Most exercise professionals recommend one to two anaerobic training sessions per week. Units who schedule running three times a week should consider two anaerobic and one aerobic running session. For optimal performance, include at least one recovery day in between anaerobic sessions.

The 300-Yard Shuttle Run

This activity develops the ability to repeatedly sprint after changing direction. It is an indicator of the Soldier's anaerobic endurance, speed, and agility. On the command, "GO," the Soldier sprints to a line 25-yards from the starting line, touching it with the left hand, then returns to the start line and touching it with the right hand (one repetition). Soldiers repeat this until they complete 300 yards or six repetitions. On the last (sixth) repetition, the Soldier sprints past the starting line without touching it. Soldiers repeat this entire sequence 3-4 times during a PRT session or only one time when used with 30:60s or 60:120s.

In later phases, the 300-yard shuttle run may be conducted with equipment. Unit leaders must use caution when conducting the 300-yard shuttle run under load. Soldiers should master this activity with wearing ACUs, boots and carrying a weapon first before progressing to wearing the IOTV and helmet. Additionally, Soldiers should wear the IOTV without plates and progress by adding plates over time. With each additional change in load, unit leaders must start with one repetition of the shuttle run and progress back up to no more than four repetitions within a PRT session. Unit leaders must ensure that no more than one repetition is done when combining the 300-yard shuttle run with 30:60s or 60:120s, especially under load.

NOTE: A Rest interval between shuttle runs is between 5 to 10 minutes.

30:60s/60:120s

Soldiers perform 30:60s or 60:120s adhering to a work to recovery ratio of 1:2. The PRT leader uses a whistle to start and stop the walking and running intervals. A ¼ mile oval running track is ideal for this activity.

Warm-up: jog/run at a slow pace (jog) for 400 m.

Do either 6-10 repetitions of the following or 8 repetitions if doing a 300 yd shuttle run as well:

Sprint 30 seconds at 80-90% maximal effort then walk 60 seconds

OR

Sprint 60 seconds at 80-90% maximal effort then walk 120 seconds.

Recovery: walk 3 minutes

Track Intervals

Intervals teach Soldiers to run faster than their normal 2-mile race pace. Ability group runners perform intervals individually, but then regroup for recovery runs.

The traditional distance for a run such as a 2-miler is 400 meter intervals, or one lap around a quarter mile track. To figure your race pace with a calculator, multiply the minutes on your APFT run x 60 and then add the seconds. Then divide by 8 (the number of laps in 2 miles). Round down on this calculation. This gives you a quarter mile race pace in seconds. Divide the number in half for your 200m race pace.

It is best to do intervals once a week. Soldiers should do intervals for the 2-3 consecutive months before the next APFT and then take a break by substituting Fartleks and tempo runs.

There are many options for running intervals. Below are a few examples:

Starter intervals: Repeat 8-16 times, for a total of 1-2 miles
- On a 400m track, start by jogging the corners.
- On the straight-aways, pick up speed x 30m, sprint x 30m, slow down speed x 30m

200m turn & burn: Repeat 10-15 times
- 200m at 10 seconds per 200m faster than 2 mile pace
- Start one repeat every 90 seconds

Quarter repeats: Repeat 3-8 times
- 400m at 4-7 seconds per quarter faster than 2 mile pace
- Rest time – 400m time

Ladders:
- 1 mile at 2 mile run pace, walk/jog 1 lap
- 800m at 5 seconds faster per quarter mile than 2 mile run pace
- 400m at 7 seconds faster per quarter mile than 2 mile run pace
- 200m at 10 seconds faster per 200m than 2 mile run pace
- 400m at 7 seconds faster per quarter mile than 2 mile run pace
- 800m at 5 seconds faster per quarter mile than 2 mile run pace

Speed and Agility Drills

For each of the following types of exercises, pick 6-10 of the recommended exercises and perform 3-5 repetitions focusing on proper performance of each drill and increasing speed, intensity or power of each succeeding repetition. The rest interval is twice the work interval.

Movement Drills (no equipment) – mark out a 30-50 meter distance using cones for start and stop points. Sample running exercises are on pages 80-84. In later phases, increase the distance to 60-75 meters and perform drills while wearing ACUs/combat gear, weapon or holding a stick to simulate a weapon.

Agility ladder – either purchase one through an exercise supply company or make one by using rope and small PVC pipe. Drill holes in the PVC and thread the rope to make approximately 18 inch squares. Knot the rope on either side of the PVC to prevent slippage. Sample agility ladder drills are on pages 85-90. Focus should be on proper performance of the drill without stepping on ladder rungs or sides of ladder. Once Soldiers master these drills, additional ideas are readily available through multiple sources including the internet.

Hurdles – purchase 6-12 inch hurdles (banana steps) through an exercise supply company or make them using short cones with PVC pipe, etc. Jumping over these hurdles is a plyometric activity and requires advanced strength of the lower extremities. Therefore, Soldiers need sufficient strength training prior to the adding this into their PRT session. Set up 8-15 hurdles in a row with enough distance to allow the feet to land between them but close enough to prevent taking an extra step to clear the next hurdle. Varying heights increase the difficulty. Sample hurdle drills are on pages 91-94. Focus should be on proper performance of drill without knocking over hurdles. Note: Soldiers can substitute the same patterns in the agility ladder section using hurdles.

Cone Drills – using cones, make a course that requires a multitude of movement patterns. This helps Soldiers learn to sprint, cut, shuffle, and change direction simulating maneuvering around obstacles and on a variety of terrains. Sample cone drills are on pages 95-97. Consider using rocks, trees, PT belts, etc. to substitute for cones.

Fartleks

Highly recommend ability groups for this activity. Start with a warm up, then alternate speed play at durations of 30 seconds to three minutes at 70-90% max heart rate with recovery jogging afterwards. This is a continuous running effort for 25-35 minutes at a variety of speeds. This anaerobic exercise is a good option in place of interval training.

Last Man Up Drill

This drill involves running in a single file at a moderate intensity, interspersed with short sprints. The drill is best performed in squad or section-sized groups (7-10 runners). Warm up with at least a 5 minute jog. The PRT leader decides the space between runners, sets the pace and determines when the last runner in the file sprints to the front of the line. Do this for 20 minutes, progressing to 30 minutes in later training phases. At the end of the exercise session, recover by jogging for 5 minutes.

Hill Repeats

This activity is an effective means of developing explosive leg strength and anaerobic endurance. The intensity and duration of the repetitions depends upon the characteristics of the hill. A short steep hill is ideal for explosive efforts (15-20 seconds up and 30-60 seconds down for 5 to 10 repetitions). Long, gentle slopes are best for sustained efforts of moderate intensity (45-60 seconds up and 90-120 seconds down for 4 to 6 repetitions).

For proper execution lean slightly forward without bending at the waist. On steep hills, the knees need to rise higher than normal to permit a full stride. Start with 3-5 repetitions and add no more than one repetition every two weeks. The PRT leader determines the repetitions and signals the start of each group or individual. NOTE: Do not conduct hill repeats wearing combat equipment.

Conditioning Obstacle Course

Obstacle course running develops physical capacities and fundamental skills and abilities that are important to Soldiers in combat operations. In order to negotiate the obstacle, Soldiers must crawl, creep, climb, walk, run, or jump. Soldiers can progress to wearing IOTV and/or a fighting load to increase the demand and difficulty.

Movement Drill, Speed Running 1

Verticals


This exercise promotes a strong running posture. Keep a tall stance with a stable, upright trunk as you bring the hips quickly to 90 degrees flexion. Ground contact should be primarily with the balls of the feet and should be fairly explosive. There is no backswing of the legs for this drill. Arm swing is strong and smooth.

Movement Drill, Speed Running 2

Laterals



This exercise gets Soldiers accustomed to lateral movement. Start by assuming a slight crouch, with the back straight. Shuffle directly to the side by pushing off with the back leg and controlling the distance traveled with the front foot. Greater power can be generated this way particularly when under load. Land back in the crouch position with the knees about shoulder width apart. Do not bring the feet closer than one foot apart. When returning to the start, face the same direction so half the time is spent going left and half going right.

Movement Drill, Speed Running 3

Backwards Run

On this exercise, Soldiers should work on reaching back with the rear leg and pushing off forcefully with the forward leg. Keep the body upright, not bent forward or backward at the waist.

Step distance should not be overly long to compromise balance. In later phases, hold a stick or weapon in the hands to further challenge balance.

Movement Drill, Speed Running 4

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 approach 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.

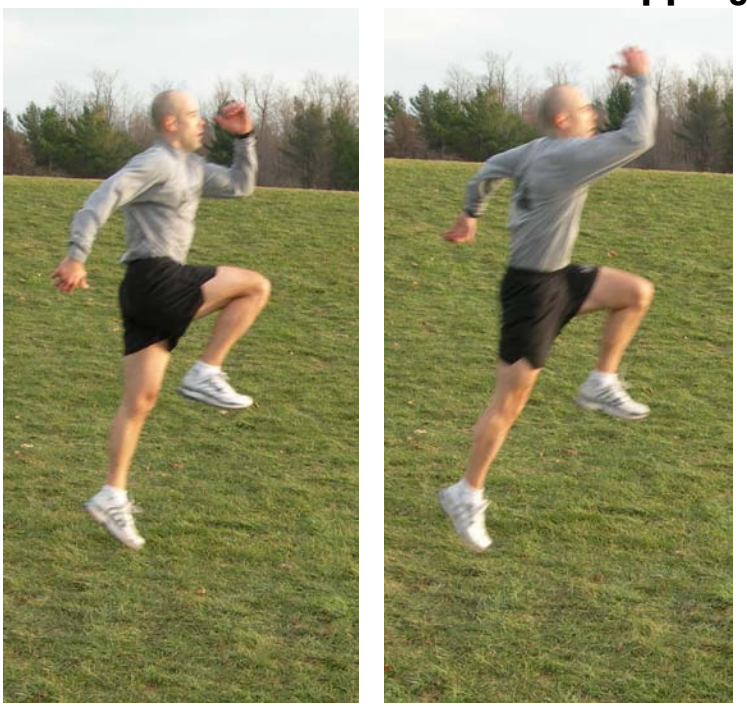
Movement Drill, Speed Running 5

Crossovers

This is similar to the side-step shuffle except that the trailing leg crosses first to the front and then to the back. Keep the body oriented in the same direction on both the down and back portion of this drill so half the time is spent going left and half is going right. As Soldiers master this movement, have them hold a stick or weapon to further challenge their balance.

Movement Drill, Speed Running 6

Skipping



Multiple variations of this exercise can be performed. This exercise is similar to the skip from grade school.

The first variation is a quick skip where Soldiers keep their feet very low to the ground and take small skipping steps as quickly as possible. The goal is to achieve the smallest, fastest steps possible to work on quick reaction times.

A second option is the power skip where Soldiers skip as high and as far as possible with each step (pictured). After three to four weeks of training, Soldiers should incorporate more arm swing as they jump so they get better elevation.

Movement Drill, Speed Running 7

Bounding

This exercise is similar to running with the goal of achieving a long "hang time". With each running step, give an explosive push-off in order to achieve prolonged time in the air. Arm swing must be powerful to assist elevation.

Make sure Soldiers alternate legs and do not perform a skip. This is a very stressful exercise on the lower extremities, so the number of repetitions should be kept low.

Movement Drill, Speed Running 8

Accelerations

This exercise is designed to train explosive starting power, which is essential for Soldiers in a combat environment. Jog or walk at a minimal speed, then at a prescribed point or whistle, accelerate to a near maximal effort. At the point of acceleration, lean slightly forward, raise the knee slightly higher, and "punch" your foot into the ground to propel faster while increasing the tempo of arm swings.

Perform at least three hard "punches" to attempt to reach max speed within 5-10 steps and maintain until the end of the prescribed distance or until cover is reached.

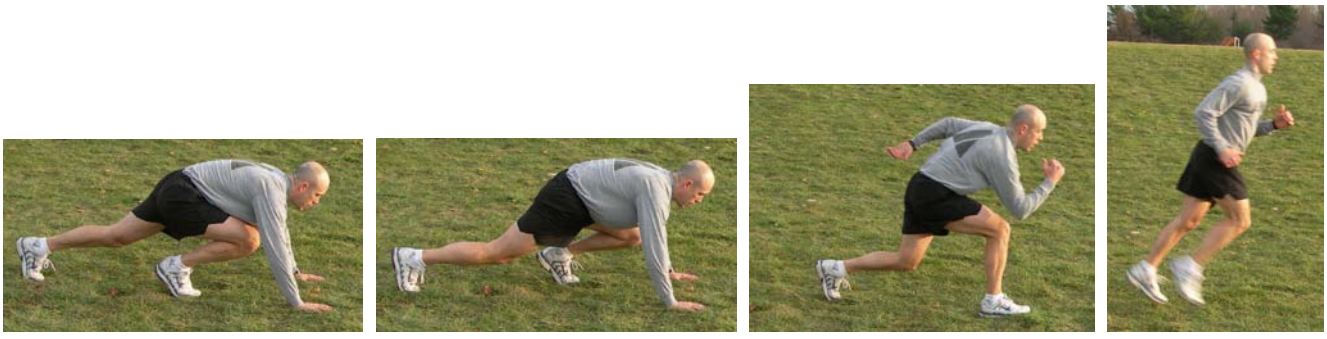
Movement Drill, Speed Running 9

Forward Falls

Rise up onto the balls of your feet with the trunk strictly upright and the chest high. Fall forward and at the last instant get one leg quickly out in front to catch the fall, immediately going into a sprint. Do not take a long stride with the first step, as this will create a braking effect. Make sure the first three steps are strong "punches" into the ground to propel you forward without losing your control. Perform 2-3 falls for each 50 yard segment. This drill is another option to increase explosive starting power.

Movement Drill, Speed Running 10

Mountain Climber Sprints



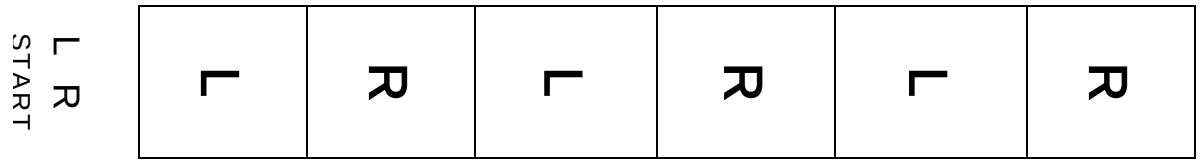
This exercise uses elastic energy to promote an explosive start. Perform a normal mountain climber and on the third or fourth count or at the sound of the whistle, explode into a sprint. As with the accelerations and forward falls, make sure the first 3-4 steps are strong punches into the ground. This should bring Soldiers into an upright position and full sprint within 5-10 steps.

Movement Drill, Agility Ladder 1

Forward One In

Facing the length of the ladder, simply run through the ladder initially placing one foot in each square. Stay on the balls of the feet with minimal leg lift and without touching the ladder. Correct performance is important before trying to increase speed.

A variation of this drill is to perform with high knees. This drill can also be performed over short hurdles.

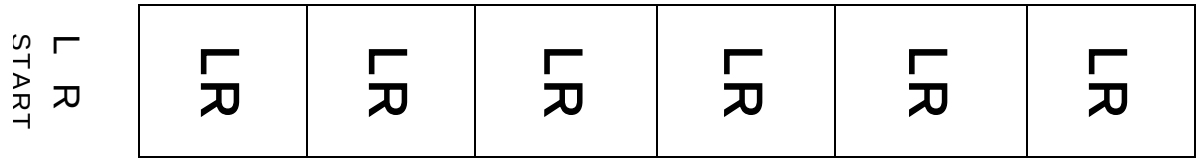


Movement Drill, Agility Ladder 2

Forward Two In

Facing the length of the ladder, simply run through the ladder placing each foot in each square. The feet should move independently of each other. Stay on the balls of the feet with minimal leg lift and without touching the ladder.

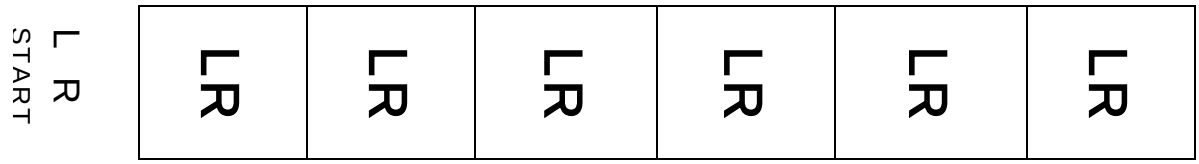
Soldiers can very performance with high knees or over short hurdles.



Forward Hops

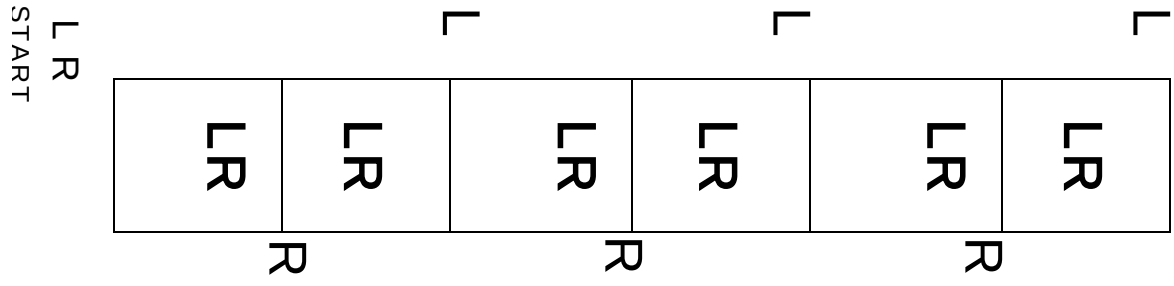
Standing outside the first square and facing down the length of the ladder, jump into each square by staying on the balls of the feet with the feet together. Keep the trunk upright throughout the exercise.

This drill can be performed for speed or for height/power. The goal is to control the landing and quickly transfer power to the take off.



Forward Shuffle

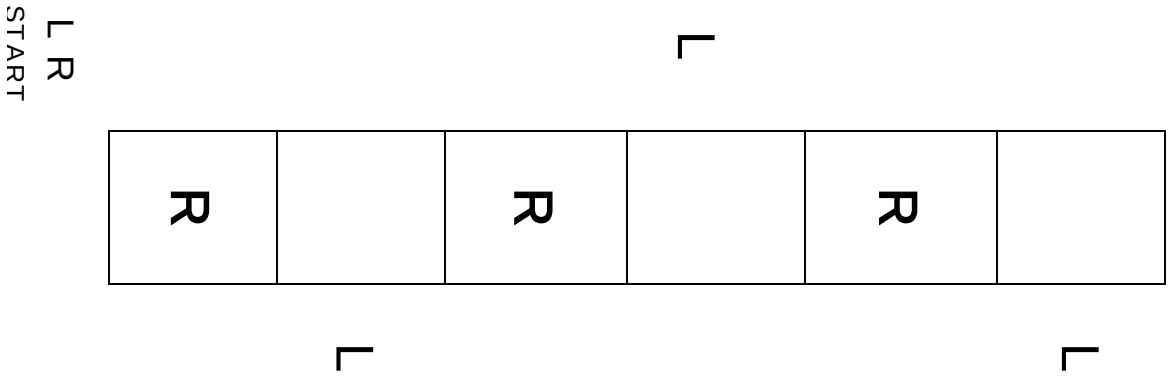
Standing outside to the left and slightly behind the first square, step in with the right foot then shuffle the feet so that the left foot moves into the first square as the right foot is moving out of the square and to the right. Move the left foot into the second square. Shuffle the feet again so that the right foot moves into the second square as the left foot moves out of the square and to the left. Move the right foot into the third square. Continue the pattern for the length of the ladder and increase speed as able.



Movement Drill, Agility Ladder 5

Ladder Weave

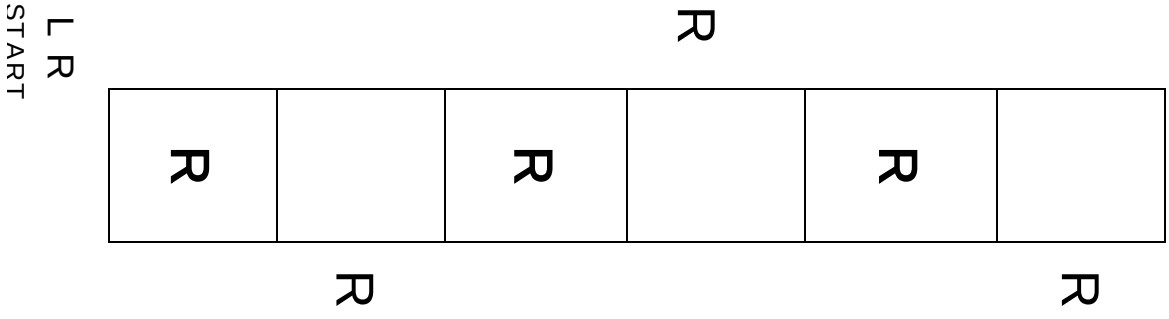
Standing outside to the left and slightly behind the first square, step in the first square with the right foot, then cross the left leg over the right to the right side of the second square. Bring the right foot forward to the third square and cross the left leg to the left of the fourth square. Continue for the length of the ladder and increase speed as able.



Movement Drill, Agility Ladder 6

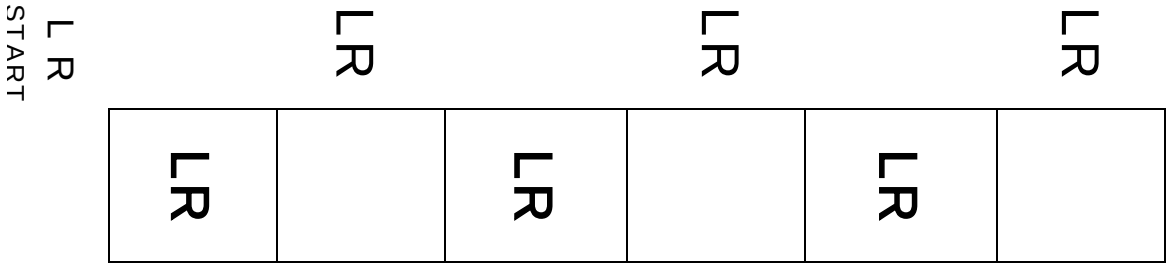
Ladder Weave – Single Leg

Standing outside to the left and slightly behind the first square, step in the first square with either the right or left foot. Hop to the right of the second square with the same foot. Hop in to the third square and then to the left of the fourth square. Continue down the length of the ladder. Repeat the process using the other leg. An even number of repetitions should be performed.



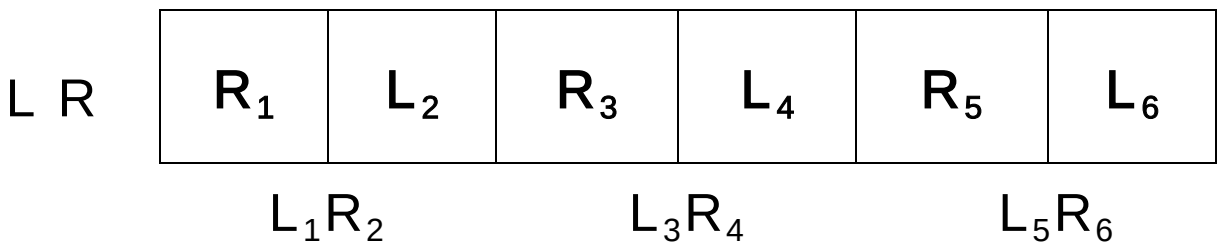
Ladder Weave – Double Leg

Standing outside to the left and slightly behind the first square, jump in the first square with both feet, then back out to the left of the second square. Continue jumping in and out of the ladder for the whole length. The pattern can also be varied to look like the previous two drills.



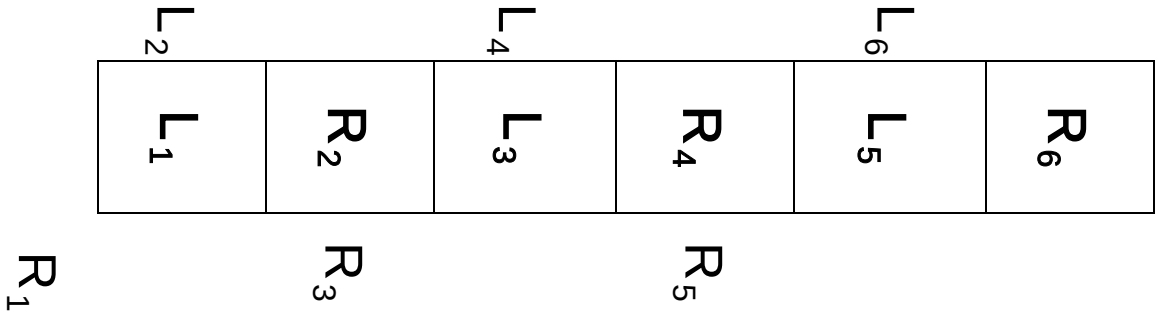
Lateral Crossover

With your right side facing the length of the ladder, step in the first square with the right foot. Place the left foot behind the right foot and outside of the square. Bring the right foot out of the square and beside the left foot. Step into the second square with the left foot. Step into the third square with the right foot, etc. Keep the trunk facing perpendicular to the ladder. Allowing the hips to swivel makes this drill feel more natural. Increase speed as able. When all have finished, go back down the ladder with the left leg leading.



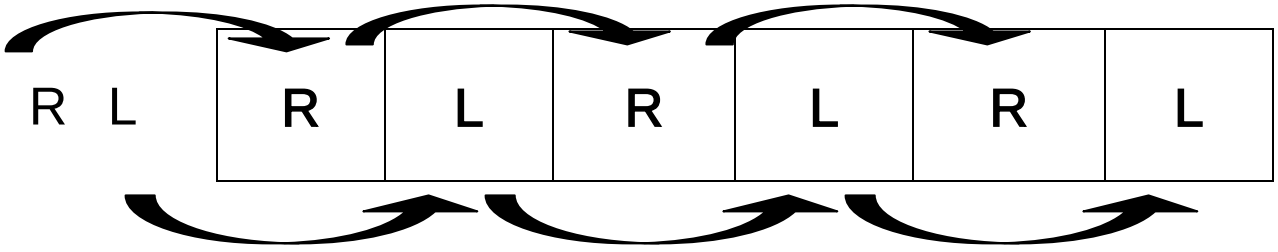
Forward Slalom Jump

Face the length of the ladder with the left foot in the first square and the right foot trailing outside it. Squat the legs to generate increased power and jump up and across the ladder, landing so that the right foot is in the second square and the left foot is outside the first square. Pause between each jump so that a proper squat can generate greater power. On the next jump, go back across the ladder with the left leg landing in the third square and the right leg outside the second square. Continue the length of the ladder.



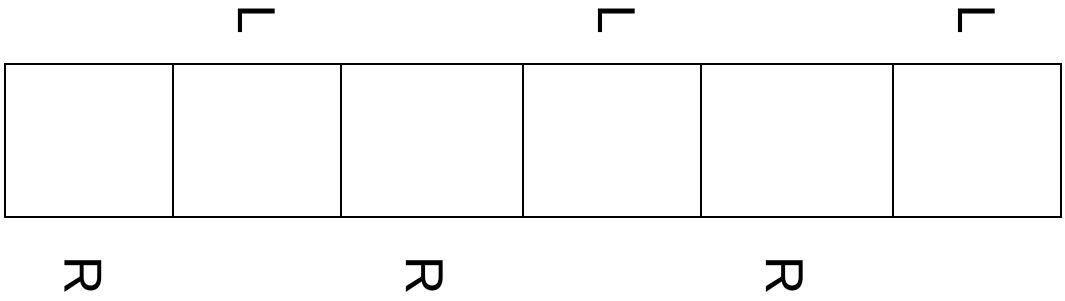
180 Degree Jump

With your left side facing the length of the ladder, squat slightly to jump and spin 180 degrees landing with the left foot still outside the ladder and the right foot in the first square. Jump and turn 180 degrees to land with the right foot still in the first square and the left foot in the second square. Pause between each jump to generate greater power. Continue for the length of the ladder. Attempt to always land softly with vertical alignment of the shoulders, knees, and balls of the feet. Also attempt to keep the feet pointing perpendicular to the length of the rope. This drill develops strength and power, not speed.

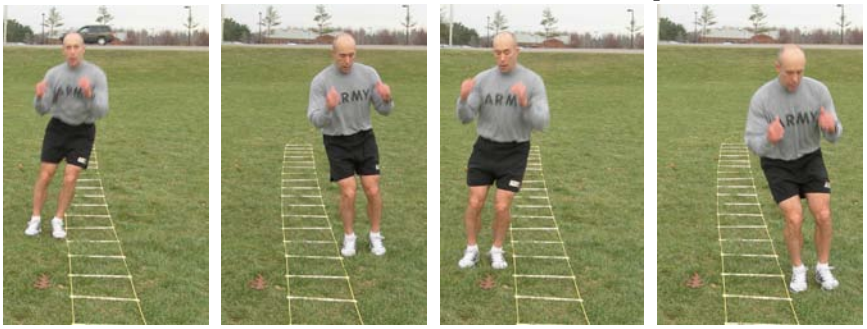


Skater Hops – Single

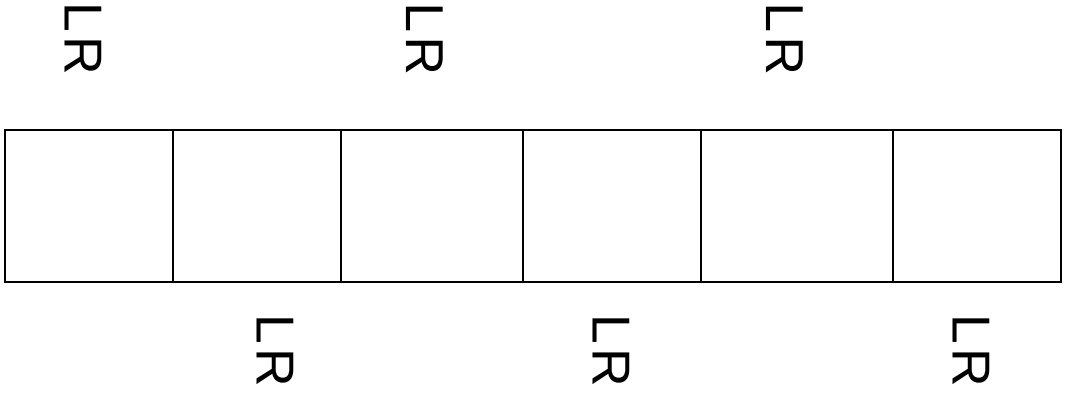
Standing outside to the left and slightly behind the first square, jump with a strong lateral push and land with the right leg to the outside of the first square. Next jump lateral with the left leg across the ladder to land to the left of the second square. Generate greater power by jumping as far outside the ladder as able. Continue for the complete length of the ladder.



Skater Hops – Double



Standing outside and to the left of the first square, jump across the ladder to the right of the second square. Continue jumping across the ladder with both feet together for the length of the ladder. This drill can be done for lateral distance or vertical height.



Movement Drill, Hurdles 1

Double Leg Hops

Jump with both legs over each hurdle for the length of the hurdle line. Focus should be on good landing form and control, then an arm swing with immediate return to jumping over next hurdle. This drill can be done for speed or for vertical height/power.

Movement Drill, Hurdles 2

Single Leg Hops

This drill is designed to improve power, balance, and coordination. Jump with one leg over each hurdle for the length of the hurdle line. Focus should be on good landing form and control. Soldiers should attempt to “stick and hold” the landing. If a Soldier has poor control on the landing, concentrate efforts on a controlled landing by slowing down the process to ensure injuries are avoided. Repeat the line again with the other leg. An even number of repetitions should be performed to ensure equal opportunity for both legs.

Lateral Hops – Double or Single

Turn sideways to the hurdles. Jump with both legs over each hurdle for the length of the hurdle line (pictured above). Focus should be on good landing form and arm swing with immediate return to jumping over next hurdle. Repeat the line again facing the opposite direction.

This drill can also be performed with a single leg. Soldiers should attempt to "stick and hold" the landing. There should be sufficient pause between jumps to demonstrate good balance.

Lateral Hops – Single Leg Alternating

Turn sideways to the hurdles. Jump over the hurdles with one leg leading. Both legs should land independently between the hurdles. Continue for the length of the hurdle line. Focus should be on good landing form with immediate return to jumping over next hurdle. Repeat the line again facing the opposite direction.

Movement Drill, Hurdles 5

Lateral Shuffle Weave

Start behind and to the left of the hurdles. In a partial squat position, step with the right foot between the first and second hurdles, shuffle feet to the right of the hurdles and then between the second and third hurdles to the left. Continue to shuffle back and forth between the hurdles for the length of the line. Focus on keeping the body in a low squatted position without knocking over the hurdles.

Movement Drill, Hurdles 6

Power Jumps

Start behind and to the left of the hurdles. Jump with both legs diagonally over and to the right beyond the first hurdle. Focus should be on good landing form and arm swing with immediate return to jumping left over the second hurdle. Continue jumping diagonally over the hurdles for the length of the line.

Single Hurdle Jumps – low

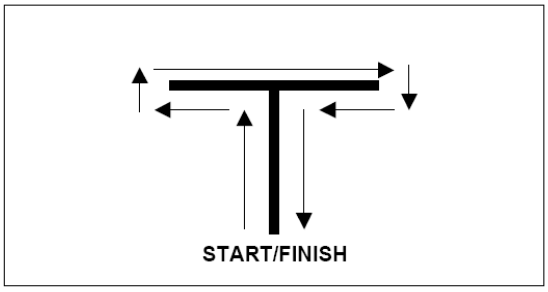
Using a single 6” hurdle, jump laterally over the hurdle. This can be initially done with two legs working up to the more difficult option of one leg only. Initial efforts with this exercise should concentrate on a controlled landing. Soldiers who can control the landing can continue jumping quickly back and forth over the hurdle. Focus should be on good landing form and arm swing. Perform this exercise for a specific period of time or number of repetitions. This drill works well in circuit training. In later phases, the hurdle can be turned and the Soldier jumps over the longer length of the hurdle.

Single Hurdle Jumps – High

Using a single 12” hurdle, jump laterally over the hurdle. This drill can be progressed the same as the explanation above with the low hurdle, building up to jumping quickly back and forth over the hurdle. Focus should be on good landing form and arm swing. Perform this exercise for a specific period of time or number of repetitions.

Movement Drill, Cones 1

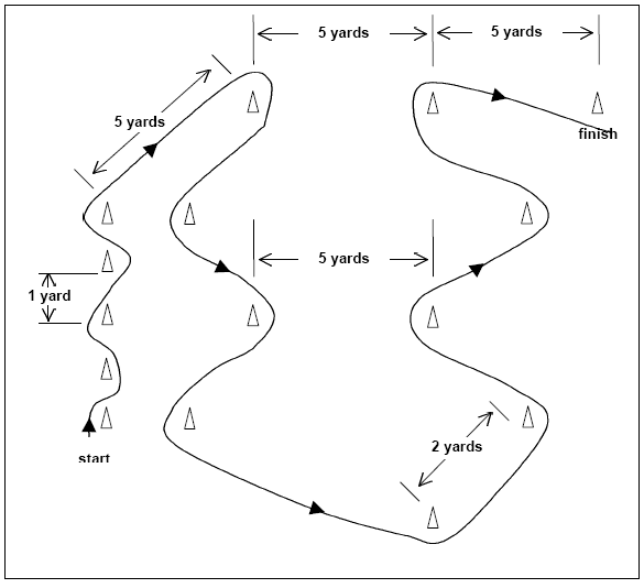
The "T"



Cones or a similar barrier are placed in a T-shape, measuring 10 yards along both the length and the width of the T. Soldiers start in a column one step to the left of the bottom of the T. Run forward along the left side of the T, perform a left lateral shuffle to the end of the T, step forward and perform a right lateral shuffle along the width of the T, step back and perform a left lateral shuffle to the center, then run backward to the bottom of the T. Soldiers will always be facing the same direction as they perform the exercise while maintaining a good power position. Multiple repetitions are performed maintaining a 1:2 work/rest ratio, or a 1:1 work/rest ratio in later phases.

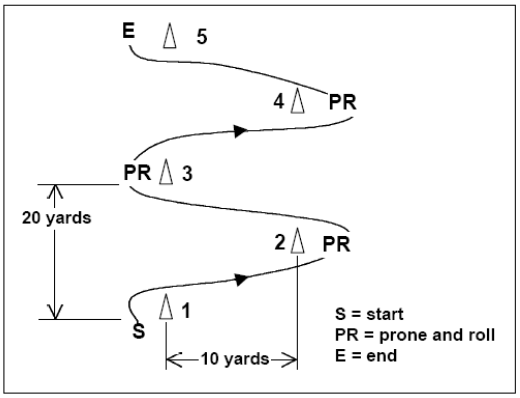
Movement Drill, Cones 2

The Maze



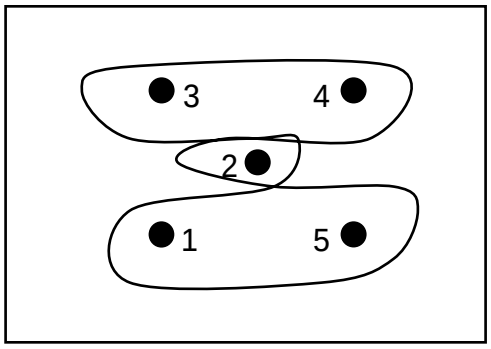
Fifteen cones are needed for this drill. Move through the first five cones performing a forward shuffle. Do not jump from cone to cone, but rather use a shuffle step to ensure that the outside foot is placed close to and just outside of the cone. Run to and around the sixth cone and begin a right diagonal shuffle to the 7th cone while facing toward the finish. Proceed in this manner around the 9th cone, then run straight to and around the 10th cone. At cone 11, begin a left diagonal shuffle, facing in the direction of the finish. Continue in this manner through the remainder of the course. Return to the start and repeat, allowing at least one minute for recovery. PRT leaders must ensure adequate spacing of 6-8 cones between Soldiers performing this drill before sending the next Soldier to ensure maximal effort for everyone. Variations of this pattern can be used with trees or rocks while in a field environment.

The Rush



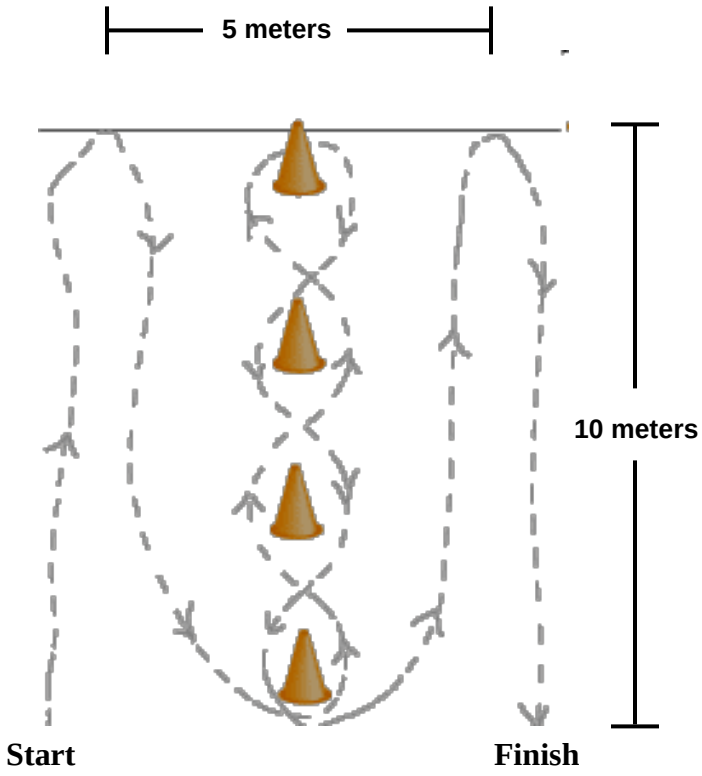
The Rush will develop the foundational skills and techniques needed to move under direct fire with weapon and equipment. The Rush can be performed in ACUs with boots after initial proficiency is demonstrated. Individual weapon and equipment should be added as Soldier's readiness progresses. Five cones are needed for this exercise. Start in the prone position behind cone one. On the command GO, roll once to the left, rise to the ready position, race to cone 2 and enter the prone position, roll once to the right, and repeat through the rest of the course. Time stops when the Soldier reaches the prone position behind cone 5. When performing The Rush with individual weapon and equipment, Soldiers will rise up and fall forward to the prone position using Individual Movement Techniques (IMT). The low crawl and high crawl can also be incorporated in The Rush.

The Box & 1



Start behind cone 1, sprint in front of that cone, then behind and around cone 2. Sprint back left and behind and around cone 3. Sprint back to the right and in front of and around cone 4. Sprint back left and around the cone 2. Sprint right and around cone 5 then return to cone 1, the start point. To maintain a good 1:2 work/rest ratio, have three Soldiers rotate one after the other repeatedly through the course for the overall prescribed time or number of repetitions. The cone distance can vary according to your training needs. Cones spaced close together will require more agility to navigate and cones spaced further apart will require greater endurance.

Illinois Agility Test



This drill can be used for training or testing purposes. The purpose of this drill/test is to train/measure quickness and agility. Given a flat, paved surface, with a length of 10 meters and width of 5 meters, set up four cones marking the outer boundaries and four other cones 3.3 meters apart in the center. The Soldier lies face down behind and outside the start cone. The grader will give a preparatory command, "READY." On the command "GO", the Soldier rises and negotiates the course around the cones to the finish per the diagram above. If the Soldier hits the cone enough to move its position, the test must be repeated. The grader records the total time taken from the command of "GO" to when the Soldier passes the last cone. Soldiers that slip are given one other attempt to improve their score. Soldiers that fail to navigate the course properly may repeat the assessment either immediately or after others in the squad have finished.

Aerobic Endurance Training

Preparing Soldiers for the potential rigors of the combat environment requires both aerobic and anaerobic endurance training. Running 3-5 times per week at a slow to moderate pace does not adequately prepare Soldiers for the combat environment and may lead to overuse injuries. In order to reduce the incidence of overuse injuries, units must balance high and low impact training.

Aerobic endurance training uses large muscle groups that demand more oxygen and nutrients, thus the heart has to work harder. Continuous, rhythmic exercise keeps the cardiorespiratory system primed, unlike stop and start activities. Maintaining the proper intensity and allowing for "recovery" are key components to improving aerobic endurance while minimizing risk of injury.

How do units determine the correct intensity?
Moderate intensity - Soldiers can talk but not sing.
Vigorous intensity - Soldiers can talk in short phrases and are breathing rapidly.

The following section provides a variety of aerobic endurance exercises that will help units keep their Soldiers physically fit without increasing the risk of injury.

Ability Group Running (AGR)

Ability group runs are appropriate for either aerobic or anaerobic running sessions. For proper use of AGR, assign Soldiers to ability groups based on 2-mile run times on the most recent APFT. There should be no more than one minute between the fastest and slowest member in each group to ensure a sufficient training effect for all members. AGRs are appropriate for long-slow runs, tempo runs, fartlek runs, and cross-country runs. Each ability group runs at a prescribed pace intense enough to produce a training effect for the group and each Soldier. Leaders should program these runs for specific lengths of time, not necessarily distance. This training method provides a challenge for each ability group while controlling injuries. The current recommendation from the Center for Health Promotion and Preventive Medicine (CHPPM) is to run no more than 30 minutes, 3 times per week.

Release Run

Release runs combine the benefits of group running and individual Soldier performance at higher training intensities. Soldiers run with the group to a specified time (no more than 15 minutes), then are "released" to run as fast as they can back to the starting point, retracing the original route. The group then rejoins to continue the remainder of the scheduled PRT events for that day.

Terrain Running

Running through local training areas, over hills, and around obstacles improves mobility, endurance, and the ability to stop, start, and change direction. Terrain running is ideal for smaller groups (squads or sections). Distances should generally be one mile for densely wooded areas and up to two miles on tank trails and open fields. Intensity is relative to the terrain. Soldiers should perform terrain running in ACUs and well-fitting boots. In later phases, Soldiers may progress to performing terrain runs with IOTV, helmet, weapon, and under fighting load.

Unit Formation Run

This activity is based on a time and distance that can be achieved with unit integrity and a display of unit cohesion. There are intangible rewards gained from running with a group (esprit de corps, team building, and discipline). Keeping a large unit in step with proper distance intervals and correct running form offers other benefits that leaders desire. Unit formation runs should be performed no more than once per quarter due to the limited training effect offered for the entire unit. The unit formation run begins with a gradual increase in intensity for the first three minutes or ¼ mile, continues at a prescribed target pace for a specified time and concludes with a gradual decrease in intensity for the last three minutes or ¼ mile. The unit commander is responsible for establishing a pace achievable by all Soldiers in the unit.

Foot Marching

This activity is a critical Soldier physical requirement. Regular foot marching prepares Soldiers to successfully move under load. Smart progression is essential to minimize injuries. Consider pace and training volume when planning this activity. Start with a light load (up to 20% body weight), a relatively short distance (2-3 miles), and a slow pace (>20 minutes). Progression should involve increasing only one of the three variables (load, distance, pace) from one march to the next. See Appendix D for a sample progression program. For a proper training effect, studies support a frequency of two to four foot marches a month. Foot marching more than once a week requires sacrificing another anaerobic endurance activity to allow for proper recovery.

The goal of foot march training is to ensure Soldiers can perform worst-case, mission-related marches without becoming exhausted. Consider performing live fire or MOS-related training upon completion of a foot march to assess the unit's ability to continue operations upon reaching an objective.

Swimming/Water Aerobics

Making use of the pools on base is a great non-impact option for tough cardiovascular training. The resistance provided by the water allows for a good workout without the impact level that causes injuries. Lap swimming, pool running, and water aerobics all provide options for a group workout. Most pools provide some equipment that will help increase the effectiveness and variety of aquatic workouts.

Cross-country Skiing

Depending on location, some bases provide a unique opportunity in the winter to workout in new ways for many Soldiers. MWR has equipment such as cross country skis available for use. This activity is great for team and/or morale building while providing a great workout. This activity requires core strength, balance, coordination, muscular strength and endurance, as well as aerobic endurance. Dressing in light layers that can be easily removed or opened during exercise will allow ventilation and help prevent cold injuries.

Low-Impact Cardio Machines

Availability of adequate gym facilities and consequently cardiovascular machines dictates the number of days units can utilize this equipment during the week. These machines are ideal for Soldiers on profile that require a means to continue to maintain and improve their cardiovascular fitness while protecting the injured body part. For optimal performance, Soldiers using this equipment should follow the manufacturer's instruction for proper adjustment and maintain optimal posture throughout the exercise.

Options for low impact cardiovascular training include: walking on a treadmill, using a stair climbing/stepping machine, upright or recumbent stationary bike, elliptical trainer, rower, climbing machines, and cross-country ski machines.

Exercise sessions of high or moderate intensity should last 20-30 minutes. Endurance exercise sessions that address additional caloric expenditure for body fat reduction should be of low intensity and may last up to 60 minutes.

Stationary biking at the gym or biking with actual road/mountain bikes is a non-impact aerobic exercise option that adds challenge and variety to your training program. Below is an intense stationary cycling workout to use during PRT.

High Intensity Cycling: Advanced			
Interval	Resistance	Revolutions per Minute (RPM)	Time
Warm up	Light	65 PRM	2:30
Work	Heavy	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	65 RPM	2:30
		Total Time: 36:30	

Notes:

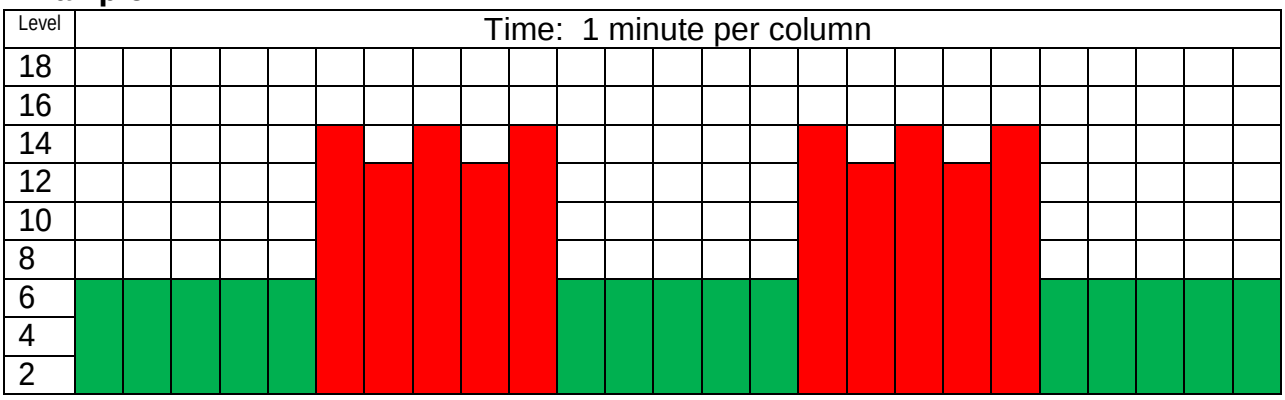
1. **Resistance on a Monarch stationary bike:**
Light = 1 KP
Medium = 2 KP
Heavy = 2.5 KP

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.

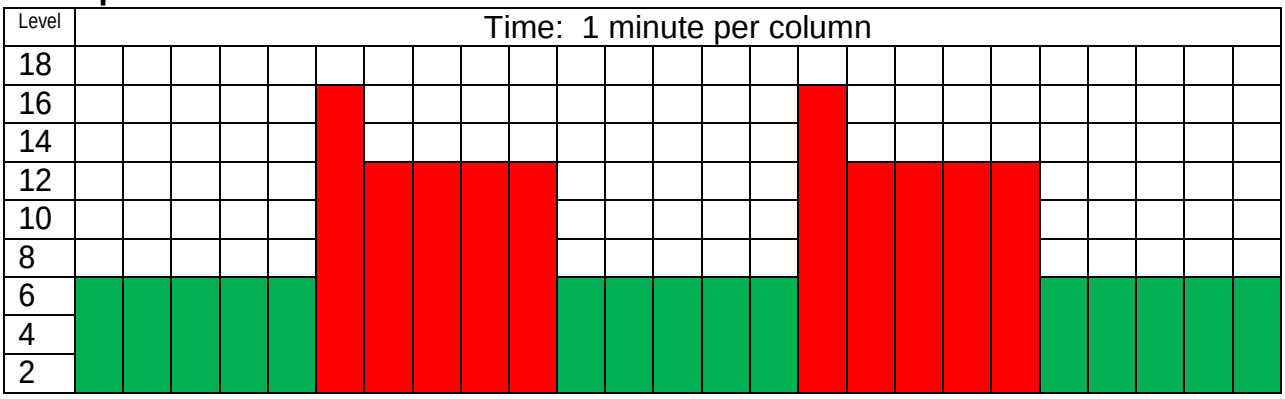
3**. Revolutions per Minute (RPM)** = number of times your left foot goes down per minute.

OPTIONS for Low-Impact Cardio Machines: The following charts provide options and mostly use interval type training which is beneficial for Soldiers attempting to shed weight and improve cardiovascular endurance. A typical low-impact cardio machine has 20 levels of intensity. The examples below demonstrate several different work-outs. Different types of machines allow adjustments for different levels of fitness. Start with 25 minutes and extend to 35-45 minutes. These examples can be conducted individually or in groups led by an exercise leader.

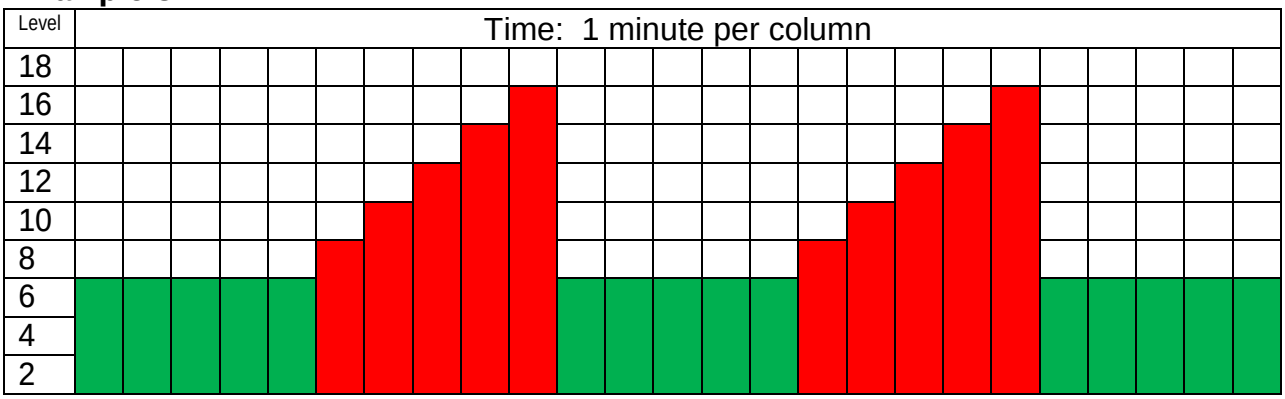
Example 1:



Example 2:



Example 3:



Recovery & Regeneration

The purpose of recovery and regeneration is readiness for the tasks come later. During recovery, Soldiers should gradually taper activities (cool-down) so that temperature and heart rate return to a pre-exercise state. Additional objectives of recovery include restore hydration, restoring energy balance through proper nutrition, and rest sufficiently to allow the body to adapt to the stress of training.

Recovery is at the end of every PRT session and should focus on flexibility as well as nutrient replacement. If time is limited, concentrate on stretching the muscles exercised during the training session. Nutrient replacement is equally important and studies show eating or drinking a snack with a 4:1 carbohydrate:protein ratio within 15-30 minutes of exercise assists with recovery between bouts of exercise. An inexpensive simple example of this would be low fat chocolate milk.[10,11] See Appendix E for more nutrition guidelines.

Units should incorporate regeneration days which consist of aquatic exercise, low-impact aerobic activities, and low-impact sports. Incorporating regeneration and recovery activities as well as rest can decrease the chance of over-training which leads to a long-term decrease in performance. Rest includes days off and ensuring adequate sleep (8 hours/night starting no later than 2200 hours when not in the field or deployed).

Stretches

In general studies show dynamic stretching is optimal prior to beginning an exercise session while static stretching is done post-exercise. Dynamic stretching involves continual movement at a slow cadence through the range of motion of the extremity being stretched. Static stretching involves isolating muscles groups and performing the stretch with precision and proper positioning while holding the stretch for 20-30 seconds in order to lengthen tissue and decrease the chance for injury. Soldiers with average flexibility need to stretch to maintain muscular length. Soldiers with decreased flexibility need to stretch more often in order to lengthen muscular tissues. Soldiers who are very flexible should not stretch because it could increase their risk for injury.

For optimal benefit, stretch the following at least 1-2 times per week:

Lower Extremity	Trunk	Upper Extremity
Hamstrings	Prone Press-Up	Pectorals
Quadriceps	Mid-back	Triceps
Hip Flexors	Mid-back Rotation	
Iliotibial Band	Low Back Rotation	
Calf x 2	Low Back Decompression	
Piriformis		
Groin		

Recovery Drill, Stretch 1

Hamstring

Perform stretch by arching low back and sitting tall, gently lean forward at the hips.

Recovery Drill, Stretch 2

Quadriceps

Perform stretch using same side hand, keep knees close together and gently pull knee backwards.

Recovery Drill, Stretch 3

Hip Flexors

Option 1 **Option 2**

Option 1: Perform stretch in half-kneeling position, lean forward, keep back upright and buttocks tucked.

Option 2: Perform stretch in half-kneeling position, lean forward, keep back upright and buttocks tucked. With same side hand, pull one heel toward buttocks.

Recovery Drill, Stretch 4

Iliotibial Band (ITB)

Perform stretch by crossing legs, put body weight on back leg, lean hip to outside while leaning upper body to the opposite side.

Recovery Drill, Stretch 5

Calf x 2

Option 1

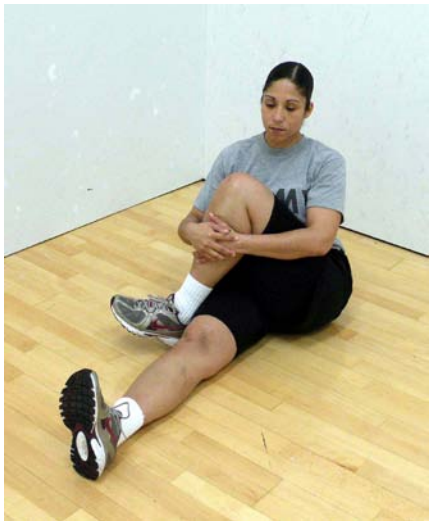
Option 2

Option 1: Perform stretch by placing one leg back, knee straight and toe facing forward. Push hips toward wall.

Option 2: Perform stretch by placing one leg slightly back, knee bent and toe facing forward. Push hips toward wall. The stretch will be felt lower down on the calf.

Recovery Drill, Stretch 6

Piriformis



Perform stretch by pulling one knee to the opposite shoulder. Do not rotate the spine.

Recovery Drill, Stretch 7

Groin

Perform stretch by placing bottom of shoes together and pulling toward body. Relax legs and gently press elbows down on legs to stretch further.

Recovery Drill, Stretch 8

Prone Press-Up

Perform stretch by lying on stomach with hands forward. Straighten elbows to raise upper body while leaving hips on floor. Relax back, shoulder, abdominal and leg muscles.

Recovery Drill, Stretch 9

Mid-back

Perform stretch by reaching hands forward, tighten abdominals and tuck buttocks toward feet, round the mid-back.

Recovery Drill, Stretch 10

Mid-back Rotation

Perform stretch with arms reaching to one side, side-bend upper body and tuck buttocks toward feet.

Recovery Drill, Stretch 11

Low Back Rotation

Perform stretch by bringing knee to hip level, use hand to rotate leg toward the floor. Relax all back muscles.

Recovery Drill, Stretch 12

Low Back Decompression

Perform stretch by hanging from a pull-up bar. Allow back and leg muscles to relax. Also perform this stretch after wearing IOTV or rucksack during the day.

Recovery Drill, Stretch 13

Pectorals

Option 1

Option 2

Option 1: Perform stretch by placing hand on wall (or tree) above shoulder level, turn away from arm allowing stretch in chest muscles.

Option 2: Perform stretch by placing hand on wall (or tree) at shoulder level, turn away from arm allowing stretch in chest muscles.

Recovery Drill, Stretch 14

Triceps

Perform stretch by pulling one elbow up and behind head.

Appendix A: Additional Strengthening Resources

Sample Weight Lifting Periodized Work Out for Individual Soldiers (6 week mesocycle)

DAY	Motion	Exercise	Week 1			Week 2			Week 3		
			Sets	Reps	Intensity	Sets	Reps	Intensity	Sets	Reps	Intensity
1	Upper Push	Bench Press	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Dips	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Overhead Press	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
	Lower Pull	Single Leg Romanian Dead Lift	4	10	40% 1RM	3	10	50% 1RM	3	8	60% 1RM
		Hamstring Curl– prone	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Hip Extension with cable	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
2	Lower Push	Front Squat	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Lunge with weights	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Calf Raise	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
	Upper Pull	Double Arm Snatch	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Bent-over Rows	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Lat Pull Down	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
3	Lower Pull	Dead Lift	4	10	40% 1RM	3	10	50% 1RM	3	8	60% 1RM
		Hamstring Curl–sitting	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
	Upper Push	Alternating Dumbbell Press	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Half-Kneel Curl & Press	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Butterfly	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
4	Upper Pull	Pull-Ups	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Upright Rows	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Standing Curl	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
	Lower Push	Single Leg Squat	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Leg Press	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM
		Knee Extension	4	10	50% 1RM	3	10	70% 1RM	3	8	80% 1RM

DAY	Motion	Exercise	Week 4			Week 5			Week 6
			Sets	Reps	Intensity	Sets	Reps	Intensity	
1	Upper Push	Bench Press	2	6	85% 1RM	2	3	95% 1RM	REST
		Dips	2	6	85% 1RM	2	3	95% 1RM	
		Overhead Press	2	6	85% 1RM	2	3	95% 1RM	
	Lower Pull	Single Leg Romanian Dead Lift	2	6	65% 1RM	2	3	70% 1RM	
		Hamstring Curl– prone	2	6	85% 1RM	2	3	95% 1RM	
		Hip Extension with cable	2	6	85% 1RM	2	3	95% 1RM	
2	Lower Push	Front Squat	2	6	85% 1RM	2	3	95% 1RM	REST
		Lunge with weights	2	6	85% 1RM	2	3	95% 1RM	
		Calf Raise	2	6	85% 1RM	2	3	95% 1RM	
	Upper Pull	Double Arm Snatch	2	6	85% 1RM	2	3	95% 1RM	
		Bent-over Rows	2	6	85% 1RM	2	3	95% 1RM	
		Lat Pull Down	2	6	85% 1RM	2	3	95% 1RM	
3	Lower Pull	Dead Lift	2	6	65% 1RM	2	3	70% 1RM	1 Rep Max of first ½ of the exercises
		Hamstring Curl–sitting	2	6	85% 1RM	2	3	95% 1RM	
	Upper Push	Alternating Dumbbell Press	2	6	85% 1RM	2	3	95% 1RM	
		Half-Kneel Curl & Press	2	6	85% 1RM	2	3	95% 1RM	
		Butterfly	2	6	85% 1RM	2	3	95% 1RM	
4	Upper Pull	Pull-Ups	2	6	85% 1RM	2	3	95% 1RM	1 Rep Max of second ½ of the exercises
		Upright Rows	2	6	85% 1RM	2	3	95% 1RM	
		Standing Curl	2	6	85% 1RM	2	3	95% 1RM	
	Lower Push	Single Leg Squat	2	6	85% 1RM	2	3	95% 1RM	
		Leg Press	2	6	85% 1RM	2	3	95% 1RM	
		Knee Extension	2	6	85% 1RM	2	3	95% 1RM	

How to do a 1 Repetition Max (RM):

1. Using a light resistance, warm-up the specific exercise using a load that easily allows 5-10 repetitions.
2. Rest 1 minute.
3. Add 10-20 lbs. for an upper body or 30-40 lbs. for a lower body exercise. Perform 3-5 repetitions.
4. Rest 2 minutes.
5. Estimate a conservative, near max effort load that will allow the completion of 2-3 repetitions. This will be accomplished by again adding 10-20 lbs. for an upper body and 30-40 lbs. for a lower body exercise.
6. Rest 2-4 minutes.
7. Increase load again by same numbers above and attempt a 1RM. If successful then…
8. Rest 2-4 minutes and add slightly more load, attempt a 1RM.

"Blitz Training" or "The Sixties"

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

Power = strength x speed. Both strength and speed are affected by resistance training at a fast pace. [12] 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 muscular endurance while increasing muscular strength at the same time.

Painless – (or near painless) The high repetition and low resistance of this system creates a high cardiovascular workout and does not cause microtears within the muscle fibers. This may decrease delayed onset muscle soreness 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 one minute)
5. Any exercise that has less than 40 reps per minute needs to have the weight reduced to allow 40-60 reps per minute.

Goals:

1. Increase rep speed to 60 reps per minute.
2. Do no less than six different exercises in each circuit.
3. Start with one circuit and progress to three circuits per session.
4. When the 60 reps per minute speed is reached through three circuits of an exercise, increase the weight of that exercise by 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/wk.

Additional instructions:

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

Example Sixties Worksheet:

Date:

Exercise	Weight	# of reps	# of reps	# of reps

Commercial Programs

There are many commercial programs on the market designed to increase strength, conditioning and power. They are popular among Soldiers, accessed online and often marketed as programs designed for elite athletes including special operations military units, police academies, champion martial artists, and tactical operations teams.

Overall, these programs include some good exercises and variety, however; some cautions should be kept in mind when trying any of these programs:

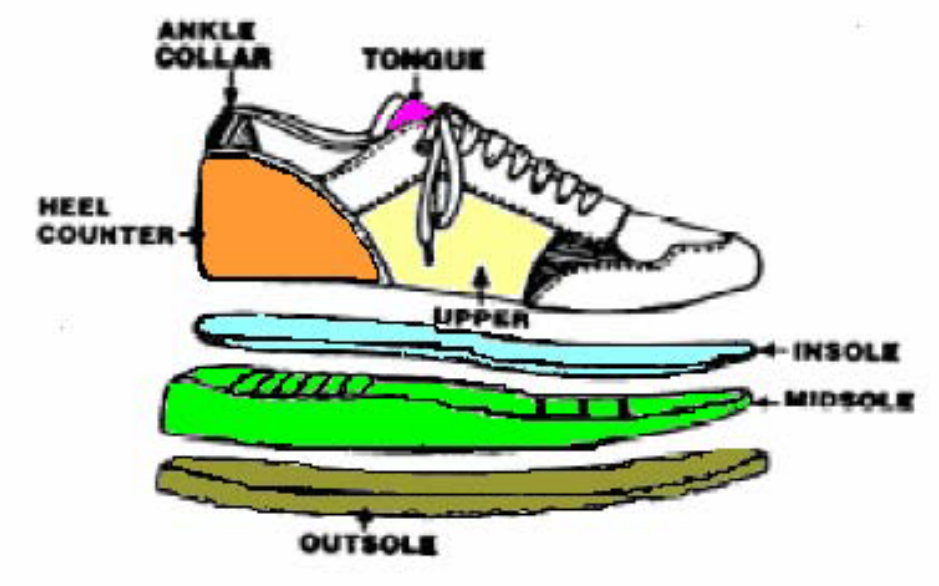
1. Be an informed consumer. The work out of the day is not for the starting weight lifter. Care should be taken to learn proper form for any exercise paying particular attention to lower back positioning.

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 than 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 past 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 or push ups with your upper body elevated).
   - When you reach muscle failure and continue the exercise with improper form, you risk injuring your ligaments, capsules, and tendons. When torn, these tissues may require surgery for repair.

4. Ensure your diet includes an adequate amount of carbohydrates, since this type of workout is anaerobic in nature. Carbohydrates (fruits, vegetables, and grains) are THE ONLY source of energy (3 types: carbohydrates, fat, and protein) that can be processed by your body during anaerobic exercise.

Appendix B:
Guide to Buying and Maintaining Running Shoes

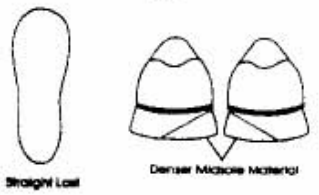


Shoe Tests – take a moment to look at your current shoes:

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

Match Foot type with proper shoe type:

Description	**Floppy Foot** (over pronator, flat feet) 	**Normal Foot** 	**Rigid Foot** (supinator, high arch) 
Best Shoe	Motion Control shoes	Stability Shoes	Cushioned Shoes
Last type	Straight or semicurved last, board/combination last	Semicurved last, combination last	Curved last, slip or combination last
Midsole	Firm midsole (dual density midsole with firmer surface on the inside) 	Dual density midsole	Dual density midsole with the firmer denser portion on the outer edge 
Other	Firm heel counter, firm arch support		Flexible sole, total contact sock liner

Buying Running Shoes

- Buy the shoe that is most comfortable to you! Not the coolest looking or most popular.
- "Breaking in" shoes is unnecessary. They should be comfortable immediately.
- Buy running shoes, not walking or cross training shoes, or running flats.
- Shop for running shoes in the afternoon or evening when your feet are largest; when you run, your feet tend to spread out.
- Wear the same socks you wear when you run.
- Allow approximately ½ inch between the end of your longest toe and the tip of the shoe. Allow some room in the height and width as well. Rule of thumb: you should be able to wiggle your toes.
- **Heel Counter View Test** – 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. (see picture)

- **Squeeze Test** – Squeeze the heel counter. A firm heel counter should not collapse while you squeeze. It should be stiff enough to prevent your foot from rolling.
- **Bend Test** – 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 in the middle of the shoe. (see picture)

- Carefully inspect the shoe for quality construction. 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.
- Walk and run with the shoes on in the store. OR keep the tags on and run on the treadmill which keeps the shoes clean. You can return the shoes if they are not comfortable.
- The heel should be snug and not slip when you walk or run.
- Running shoes will cost $50-$100. It is unlikely that you will find an adequate shoe in the $20-$40 range.
- For more assistance, go to a running specialty store where they can let you run in the shoes and do a running analysis on a treadmill before buying.

Maintaining Running Shoes – save yourself money and preserve your shoes!

- Running shoes are for running. Do not wear them for other activities.
- Try to keep your shoes as clean and dry as possible
- Do not put your shoes in the washer or dryer. Clean the shoes with toothbrush and mild soap and water. Air-dry the shoes.
- Exposure to extreme heat causes your shoes to break down faster. Thus, forcing you to replace them quicker when stationed in the Middle East, Asia or Africa.
- Stepping on the back of your shoe to remove them causes the heel counter to break down faster. Untie them and take them off with your hands.

Life Expectancy of Running Shoes

- As the shoe ages it loses its shock absorbency.
- After the first 50 miles, 15% of the midsole's shock absorption capability is lost, and 55% is lost between 400-500 miles causing more force to transfer to the legs and increasing the risk of injury.
- Replace your running shoes every 400-600 miles, approximately 6-9 months to better protect from running injuries.

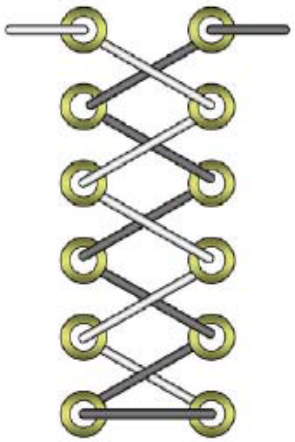
Web Resources

- The Shoe Dog is an additional resource for picking shoes at www.roadrunnersports.com. This program will walk you through selecting a running shoe and provide you with a list of suggested shoes based on you.
- www.roadrunnersports.com
- www.runnersworld.com
- www.cs.amedd.army.mil/aegis

Appendix C: Lacing Techniques

Proper lacing ensures your shoes fit and function correctly. The following lacing techniques can improve the fit of a pair of shoes or help relieve painful pressure.

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

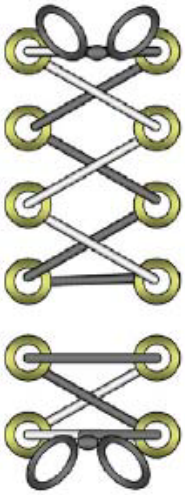


Traditional

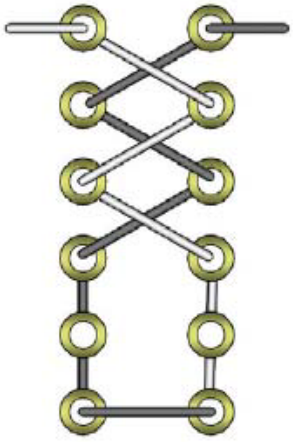
TO WIDEN THE TOEBOX OF A SHOE:

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



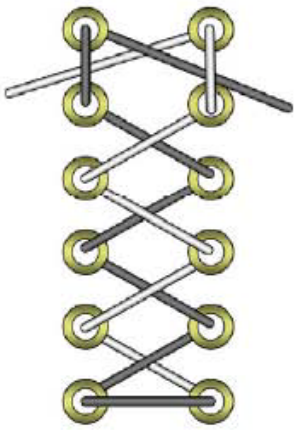
Widen Toe Box Technique #2

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).

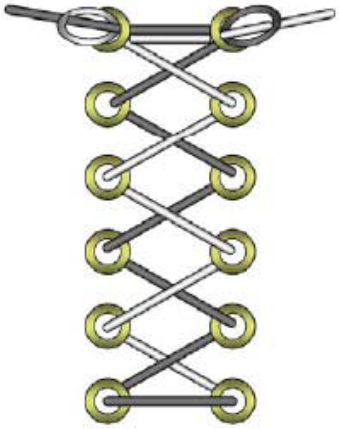
Lace-Lock Technique:
1. Lace normally until the 2nd to last set of eyelets.
2. Create a vertical section by feeding the laces upwards to the last set of eyelets on the same side of the shoe.
3. Now cross the lace over to the opposite side of the shoe and feed it through its vertical section.
4. Pull 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.



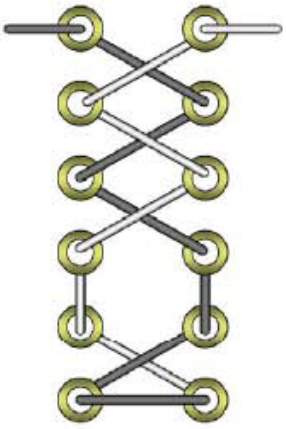
Lace Lock



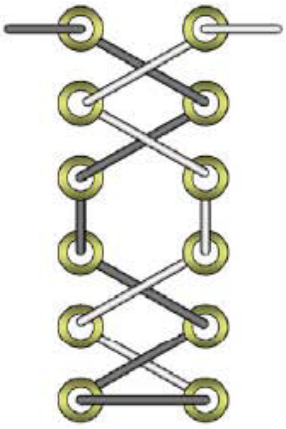
Loop Lace

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)

Appendix D:
Sample Foot March and Gear Progression

New, unfit, or return from profile Soldier:

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

For elite Soldiers and missions:

- If your mission or MOS requires that you carry more weight, advance weight by no more than 5 lbs per week.
- If your mission or MOS requires that you march a farther distance, do not increase both distance and weight at the same time.
- Advance weight, then the next week advance distance.
- Advance distance no more than 1 mile per week.

Reference weights:

Medium IOTV with all 4 plates (no ammunition): 30 lbs
Large IOTV with all 4 plates (no ammunition): 35 lbs

Appendix E: Nutritional Guidelines

The battle ready Soldier must be physically fit and injury free for optimal mission performance. Exercise leads to improvement in performance and allows Soldiers to operate effectively in various situations and under difficult circumstances. Proper diet, appropriate fueling, and healthy weight maintenance is also necessary to optimize the Soldier's training and combat performance. Exercise and diet work together, if one is lacking, physical performance will suffer and the Soldier will not be as combat effective.

Key Components

- Properly fueling your body
- Weight maintenance
- Effective supplement use
- Timing of meals and supplements

How Much Fuel Does Your Body Need?

The amount of fuel (calories) required is based upon your age, gender, height, weight and physical activity

Determine your level of activity

Category	Hours per workout	Times per week
Range Walker	0.5 - 1	3 - 5
PT Stud	1 – 1.5	3 - 5
Warfighter	1.5 - 3	5 - 7
Elite Warfighter	2 - 6	6 - 10

Estimate your energy/fuel needs

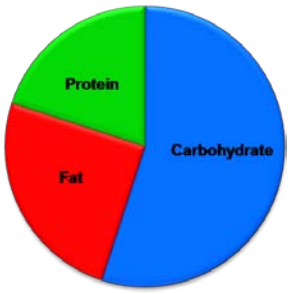
Category	Males	Females
Range Walker	Weight in lbs x 17	Weight in lbs x 16
PT Stud	Weight in lbs x 19	Weight in lbs x 17
Warfighter	Weight in lbs x 23	Weight in lbs x 20
Elite Warfighter	Weight in lbs x 26	Weight in lbs x 23

Examples:
170 lb Male Range Walker – 2,890 calories/day (170 x 17 = 2890)
130 lb Female Range Walker - 2080 calories/day (130 x 16 = 2080)
170 lb Male Warfighter - 3,900 calories/day (170 x 23 = 3900)
130 lb Female Warfighter - 2600 calories/day (130 x 20 = 2600)

*****Remember you can move between categories. You may normally be at the Warfighter level but if you become injured you might move into the Range Walker category.

What Type of Fuel Does Your Body Need?

General Guidelines for Fueling the Body



- Carbohydrate 45-65% of calorie intake
- Fat 20-35% of calorie intake
- Protein 10-35% of calorie intake

Carbohydrate
- The most readily available energy source in the body
- Main fuel source used during exercise
- Adequate carbohydrate intake will enable your body to use protein for muscle repair and rebuilding instead of for fueling
- Not eating enough carbohydrate will decrease energy and overall performance

Protein
- A primary component of muscle
  - Adequate protein consumption is vital to maintain muscle mass
  - Essential to support muscle growth with training
- Not normally used as a source of energy by the body
  - If your calorie intake is too low your body will use protein for fuel
  - Using protein for fuel decreases its ability to support muscle and can lead to poor physical performance

Fat
- Plays a vital role in the absorption of fat soluble vitamins (A,D,E,K), as well as maintaining testosterone levels and cell integrity
- Focus on eating healthy unsaturated fats, limit saturated fats, and avoid trans fats

Unsaturated	**Saturated**
Olive oil	Butter
Canola oil	Coconut oil
Avocados	Fatty meats

Weight Loss Tips and Facts

- One pound of fat = 3,500 calories
  - Decrease calorie intake by 500 calories per day to lose one pound per week
  - One 20 oz soda = 250 calories
- The most effective way to lose weight is with a combination of nutrition and exercise
- Avoid drinking beverages high in calories (i.e. sweet tea, soda)
- Avoid the overeating high calorie foods (full fat items, fried foods, deserts, shakes)
- Moderation, exercise, and tracking food/beverage intake are key
- Helpful tools include– www.fitday.com or www.sparkpeople.com

Weight Gain Tips and Facts

- To gain one pound per week, increase calorie intake by 500-1,000 calories per day
- Eat frequently to get the extra calories in without feeling stuffed all day
- Add snacks between meals (peanut butter & jelly sandwich with milk, bowl of cereal, energy bar)
- Consume energy dense foods (peanut butter, bagels, sports drinks)
- Consume a meal or supplement high in carbohydrate and moderate in protein after exercise

Determine if a Dietary Supplement will help You Achieve Your Performance Goals

Dietary supplements can be useful tools to improve physical performance. Unfortunately there are many supplements on the market that do not live up to their claims, and may even be harmful. It is important to do your homework and make sure you are buying the right supplement without wasting your money.

Questions to ask before buying a supplement

1. What is this supplement supposed to do?
2. What are the potential risks of using this product?
3. Will this product affect any medication that I am currently on?
4. Will this supplement help me reach my nutritional and performance goals?

The criterion listed below is used by the American College of Sports Medicine (ASCM) and the Australian Institute of Sport (AIS) to categorize supplements based on effectiveness and safety. Remember, not all supplements are right for all people. Even if a supplement is a category A or B it may not be right for you or may not be designed to fit your performance goals.

Group A Perform as claimed	Group B May perform as claimed More research needed	Group C No evidence of performing as claimed	Group D May be dangerous, banned, or illegal
Sports Drinks	Glutamine	Ginseng	Androstenedione
Sports Gels	Hydroxymethlybutyrate (HMB)	Nitric Oxide	DHEA
Sports bars	Colostrum	Coenzyme Q 10	Ephedra
Protein Powers	Ribose	Carnitine	Anabolic Steroids
Amino Acids		Pyruvate	Human Growth Hormone
Creatine		Cytochrome C	
Multivitamins			
Caffeine (if over used can hurt performance, do not exceed 400mg)			

*This table is current information as of 2009

Additional Resources on Supplements

The Natural Medicines Comprehensive Database, available on the Hooah Bodies Webpage on AKO, provides the most recent information on herbs, vitamins, minerals, and ergogenic aids. Information provided includes potential interactions, uses, safety, and effectiveness. The data base is constantly being updated in order to provide users with current information searchable by brand name or ingredient.

Other helpful websites include:

www.consumerlab.com: Independent group which analysis supplement content
www.wada-ama.org: World Anti Doping Agency
http://www.fda.gov/Food/DietarySupplements/default.htm: FDA's supplement webpage
http://www.fda.gov/Safety/Recalls/default.htm: FDA's website on product recalls

Fueling for High Demand Performance

- The timing of nutrient intake is important to ensure that the body has enough fuel to support performance.
- The objective of timing fuel intake is to ensure the body has enough energy for intense physical activity. Specifically to perform at max capability for an extend period of time, allow for fast recovery, and potentially improve overall performance.
- Proper nutrient timing is essential if you are in the Warfighter and Elite Warfighter categories because you have little time to rest between training sessions. Supplements such as sports drinks and protein shakes maybe beneficial to reach fuel needs.
- If you are in the Range Walker or PT Stud category, it is unnecessary for you to consume supplements to support your body during training. As long as you are eating an appropriate diet to match energy needs, you have enough time to rest and completely recover before your next bout of training.

Before Exercise

- If there is time 2-4 hrs prior to activity, have a meal that is high in carbohydrates and moderate in protein.
- Example: 1 bowl of oatmeal with raisins, brown sugar and skim milk
  1 large bagel, 1 Tbsp light cream cheese, 16 oz of juice
- If time is limited to1 hour prior, eat something light that contains carbohydrate Examples:
  - Sports drinks
  - Energy Bars
  - Granola Bars
  - Meal Replacement Beverages such as Slim Fast® or Boost®

During Exercise

- For intense exercise lasting longer than one hour your fuel stores may start to get low
- Try 30-60 g of carbohydrate per hour of exercise (if exercising for≥ 90 minutes)
- Drink or eat slowly, at least 4 oz every 15 minutes, to avoid discomfort
- Examples: Sports drinks/bars/gels

After Exercise

Goals of Recovery Nutrition

Refuel: Replenish energy stores with carbohydrates
Repair: Stimulate positive protein balance by fixing damaged muscle fibers with protein
Rehydrate: Replace fluids and electrolytes lost in sweat

A combination of protein and carbohydrate has been shown to be the best way to recover after intense training. It is recommend to have a 3:1 or 4:1 ratio of carbohydrate to protein for maximum benefit. This should be done within 30 minutes after exercise.

Supplement Option: Endurox One serving 270 kcal /1 g FAT /52 g CARBS /13 g PROTEIN
Food Option: Bowl of Cereal* One serving 210 kcal /0 g FAT /40 g CARBS /9 g PROTEIN
w/ Skim Milk

*¾ cup frosted flakes plus 1 cup skim milk

Fluid Requirements

- If time permits you should weigh yourself before and after exercise
- Drink 2 cups of fluid for each lb of weight lost during exercise
- Urine color should be pale yellow
- You should consume beverages containing electrolytes (sodium, potassium, chloride) to replace losses during training
    - Especially important in environments which increase sweat rate (i.e. extreme heats)
    - Beverage Options: Sports drinks, Water enriched with minerals

If you need additional information on building a performance nutrition plan you can always make an appointment with a dietitian

References:

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Miller SL, Tipton KD, Chinkes DL, Wolf SE, Wolfe RR. Independent and combined effects of amino acids and glucose after resistance exercise. *Medicine & Science in Sports & Exercise. March* 2003; 35(3): 449-455.

Rodriguez NR, Di Marco NM, Langley S. American College of Sports Medicine position stand. Nutrition and athletic performance. *Medicine & Science in Sports & Exercise.* March 2009; 41(3): 709-731.

Sawka MN, Burke LM, Eichner ER, Maughan RJ, Montain SJ, Stachenfeld NS. American College of Sports Medicine position stand. Exercise and fluid replacement. *Medicine & Science in Sports & Exercise.* February 2007; 39(2): 377-390.

2004 DRIs.

Appendix F: Environmental Factors

Continual assessment of a Soldier's status, mission requirements and environmental conditions will facilitate decision making to avoid injuries and illness and maximize physical fitness and mission success in different environments.

High Mountain Environments: exercise considerations

Bottom line: High mountain environments are dangerous and unforgiving for those without adequate knowledge, training, and equipment. Leaders and medical support personnel must understand the interaction of the environment and individual and unit characteristics. Adequate planning and preparedness can reduce or prevent significant problems. Leadership is key to safely train and exercise in high altitude environments.

1) Assessment of risk factors in high mountain environments:

    a. Environment: Hypoxia (low oxygen), temperature, wind, rain, terrain, UV radiation, carbon monoxide
    b. Mission: Increased work intensity, duration, uniform and load
    c. Nutritional Status: Inadequate fluid intake and nutrition
    d. Physical Fitness : Sick or injured, less fit, overweight
    e. Medications
    f. Not prepared for the high altitude (Unacclimatized)

2) Develop controls:

    a. Self and buddy checks
    b. Adequate fluid replacement and nutrition
    c. Modify workout schedule
    d. Medical evacuation planning
    e. Maintain physical fitness and good health
    f. Acclimatization and gradual ascent
    g. Adequate rest
    h. Mission planning
    i. Understand signs of high altitude illnesses and physiological changes. If left untreated, it can lead to a medical emergency

Reference:

USARIEM Technical Note 94-2: *Medical Problems in High Mountain Environments, a Handbook for Medical Officers*, February 1994.

Heat: exercise considerations

Bottom line: Humans can tolerate extended exposure to naturally occurring climatic heat stress if they are gradually introduced to hot environments (acclimatized), adequate control measures are in place, and physical activity is limited. Other specific military situations such as working in engine or boiler rooms, being in certain combat vehicles, firefighting and wearing protective clothing in hot environments can lead to heat conditions so severe they cannot be tolerated for extended periods.

Leadership is the key to safely train and exercise in hot weather. Implementing a well thought out risk management strategy facilitates exercise and military operations in heat. Soldiers should have confidence that they can master the environment through the use of preventive measures. Heat stress refers to environment and host conditions that tend to increase body temperature. Heat strain is the physiological and psychological consequences of heat stress.

1) Assessment of risk factors for heat injury and potential heat stress:

    a. Climate: High air temperature, high humidity, thermal radiation, and low air movement, wind, solar load
    b. Heat exchange: Influenced by air temperature, air humidity, wind speed, solar, sky and ground radiation, and clothing
    c. Mission: Increased work intensity, duration and Soldier status
    d. Uniform: Body armor, over-garment, load
    e. Nutritional Status: inadequate fluid replacement and nutrition
    f. Physical Fitness: Sick, less fit, overweight, medications, highly motivated
    g. Not prepared for the heat (Unacclimatized)

2) Develop controls:

    a. Buddy checks for changes in mental status
    b. Adequate water and nutrition, fluid replacement
    c. Modify work and physical activity schedules
    d. Shade or movement to cooler area
    e. Medical evacuation planning
    f. Maintain physical fitness and good health
    g. Heat acclimatization
    h. Rest
    i. Leadership: Proper planning and observation for signs of distress

References:

TB MED 507/AFPAM 48-152 (I): *Heat Stress Control and Heat Casualty Management*.

Armstrong, L. et al. Exertional Heat Illness During Training and Competition, *Medicine & Science in Sports & Exercise*, 2007 Mar;39(3):556-572

Cold: exercise considerations

Bottom line: Exercise can be performed in cold weather if Soldiers utilize appropriate safeguards to mitigate cold weather injuries.

The key to safe exercising in the cold is to implement a well thought out risk management strategy which includes:

1) Assessment of risk factors for cold weather injury:

a. Climate: Low air temperature, high humidity, thermal radiation, and low air movement, wind, solar load
b. Heat Exchange: Influenced by air temperature, air humidity, wind speed, solar, sky and ground radiation and clothing
c. Mission: Increased work intensity, duration, load carry, work rates and Soldier status
d. Uniform: Light clothing and low insulation value
e. Nutritional Status: Underfeeding, low fluid intake, use of alcohol and nicotine
f. Physical Fitness: Sick, less fit
g. Medications
h. Not prepared for cold environments (Unacclimatized)
i. Individual Factors: Female gender, long and lean body type
j. Resources: Decreased availability of clothing, shelter, food, water

2) Develop controls:

a. Self, leader and buddy checks
b. Acclimatization and planned training in cold environments
c. Appropriate weather information
d. Implement work/ rest cycles
e. Proper clothing, multi layered system
f. Good hydration and nutrition
g. Maintain fitness levels
h. Medical evacuation and first aid planning

References:

TB MED 508: *Prevention and Management of Cold-Weather Injuries*.

Castellani, J., et al. Prevention of Cold Injuries During Exercise, Position Stand, *Medicine & Science in Sports & Exercise*, 2006:Nov;38(11):2012-29

Appendix G: Conditioning While Deployed

Bottom line: "use it or lose it". While deployed, Soldiers should not quit exercising completely. At a minimum, they should perform strength training, speed and agility drills, and aerobic exercise at least 1-2 times a week.

When Soldiers deploy, many are not able to maintain their garrison exercise routine for a variety of reasons. A drop in exercise frequency results to some degree in loss of fitness, called deconditioning or detraining. However, how much the Soldier deconditions depends on many factors such as predeployment conditioning level, daily activities performed while deployed, how much exercise and what type is performed while deployed, how long the Soldier goes without exercise, and how long the Soldier is deployed. Finding the magical amount of exercise to perform in a deployed environment in order to maintain predeployment strength, endurance, and mobility is still under investigation, but research is shedding some light on this issue:

- Strength: A Soldier can maintain current strength levels by lifting 1-2 x per week, 1 set of 8-12 reps.
- Endurance: A Soldier can maintain a good portion of current aerobic fitness levels if they perform some high intensity aerobic exercise at least 1-2 x per week.

If deconditioned, how long will it take to restore predeployment fitness levels?

- Likely 2-6 weeks for those that were highly fit prior to deployment.
- However, the length of time it takes to recover depends on the original fitness level and how long the Soldier stopped exercising. It is possible that a full return to prior fitness levels could take as long as 3 months.

References:

Lemmer, J. T., et al. Age and gender responses to strength training and detraining, *Medicine & Science in Sports & Exercise*, 32(8):1505-1512, August 2000.

Sharp, M.A. , et al. Physical Fitness and Body Composition after a 9-month Deployment to Afghanistan, *Medicine & Science in Sports & Exercise*, 2008 Sep;40(9):1687-92.

Appendix H: Equipment Recommendations and Resources* for a Company Size Element**

Item	Approx number needed	Approx cost per item	Total cost	Possible resources
Agility ladder[1]	2	$70	$140	http://www.performbetter.com/detail.aspx_Q_ID_E_4580_A_CategoryID_E_383
Cones[2]	2 sets of 12	$20	$40	http://www.performbetter.com/detail.aspx_Q_ID_E_4697_A_rnd_E_27
6 lb. medicine ball[3]	4	$35-40	$160	http://www.performbetter.com/detail.aspx_Q_ID_E_4966_A_CategoryID_E_166 OR http://www.power-systems.com/p-3232-elite-power-medicine-balls.aspx
8 lb. medicine ball[3]	4	$45-50	$200	
10 lb. medicine ball[3]	4	$55-60	$240	
6" banana steps[4] (hurdles)	12	$10	$120	http://www.performbetter.com/detail.aspx_Q_ID_E_4310_A_rnd_E_22
12" banana steps[4] (hurdles)	8	$11	$88	
TOTALS BEFORE DISCOUNT			$988	
OPTIONAL ITEMS				
Resistance bands w/ handles OR 100' – cut to size	12 2 boxes (~30 pr)	$11-12 $63-73	$115 $136	www.quickseries.com OR http://www.performbetter.com/detail.aspx_Q_ID_E_3898_A_CategoryID_E_281 OR http://www.performbetter.com/detail.aspx_Q_ID_E_3717_A_CategoryID_E_359
Dumbbells	15 pairs 2pr-5 lb 3pr-10lb 4pr-15lb 4pr-20lb 2pr-25lb	 $6.25 ea $12.50ea $18.75ea $25 ea $31.25ea	$575	http://www.performbetter.com/detail.aspx_Q_ID_E_4356_A_CategoryID_E_351 OR http://www.power-systems.com/p-2430-super-hex-dumbbells.aspx
Gear bag	1 or 2	$170	$340	http://www.performbetter.com/detail.aspx_Q_ID_E_4677_A_rnd_E_3
Carry Strap for hurdles	1	$13	$13	http://www.performbetter.com/detail.aspx_Q_ID_E_4284_A_rnd_E_3
Medicine ball rack	1	$120	$120	http://www.performbetter.com/detail.aspx_Q_ID_E_4641_A_CategoryID_E_378

* We cannot endorse any specific products, these listings are possible options. Other safer, better quality, or cheaper options may exist.

** Please note this is a conservative estimate assuming that squads can rotate what days they need equipment and a company supply sergeant can sign-out items to individual squad leaders based on reservations and schedules.

[1]One squad of 10-12 Soldiers will use 2 agility ladders during a session.

[2]There are enough cones for 2-4 squads to use at a time.

[3]There are enough medicine balls for 2-3 squads to use equipment at the same time.

[4]One squad will use 20 banana steps to make 2 hurdle lines during a session.

Many companies will provide a military or government discount between 20-40%. Ask when placing an order.

References

[1] Knapik J, Darakjy S, Scott SJ, Hauret KG, Canada S, Marin R, Rieger W, Jones BH. Evaluation of a standardized physical training program for basic combat training. *Journal of Strength and Conditioning Research*, 2005, 19(2), 246-253.

[2] Knapik J, Darakjy S, Scott SJ, Hauret KG, Canada S, Marin R, Rieger W, Jones BH. Evaluation of a standardized physical training program for basic combat training. *Journal of Strength and Conditioning Research*, 2005, 19(2), 246-253.

[3] 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.

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[5] 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.

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[8] Roberts JM, Wilson IK. 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.

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[10] Karp JR, Johnston JD, Tecklenburg S, Mickleborough TD, Fly AD, Stager JM. Chocolate milk as a post-exercise recovery aid. *International Journal of Sport Nutrition and Exercise Metabolism*. 2006; 16: 78-91.

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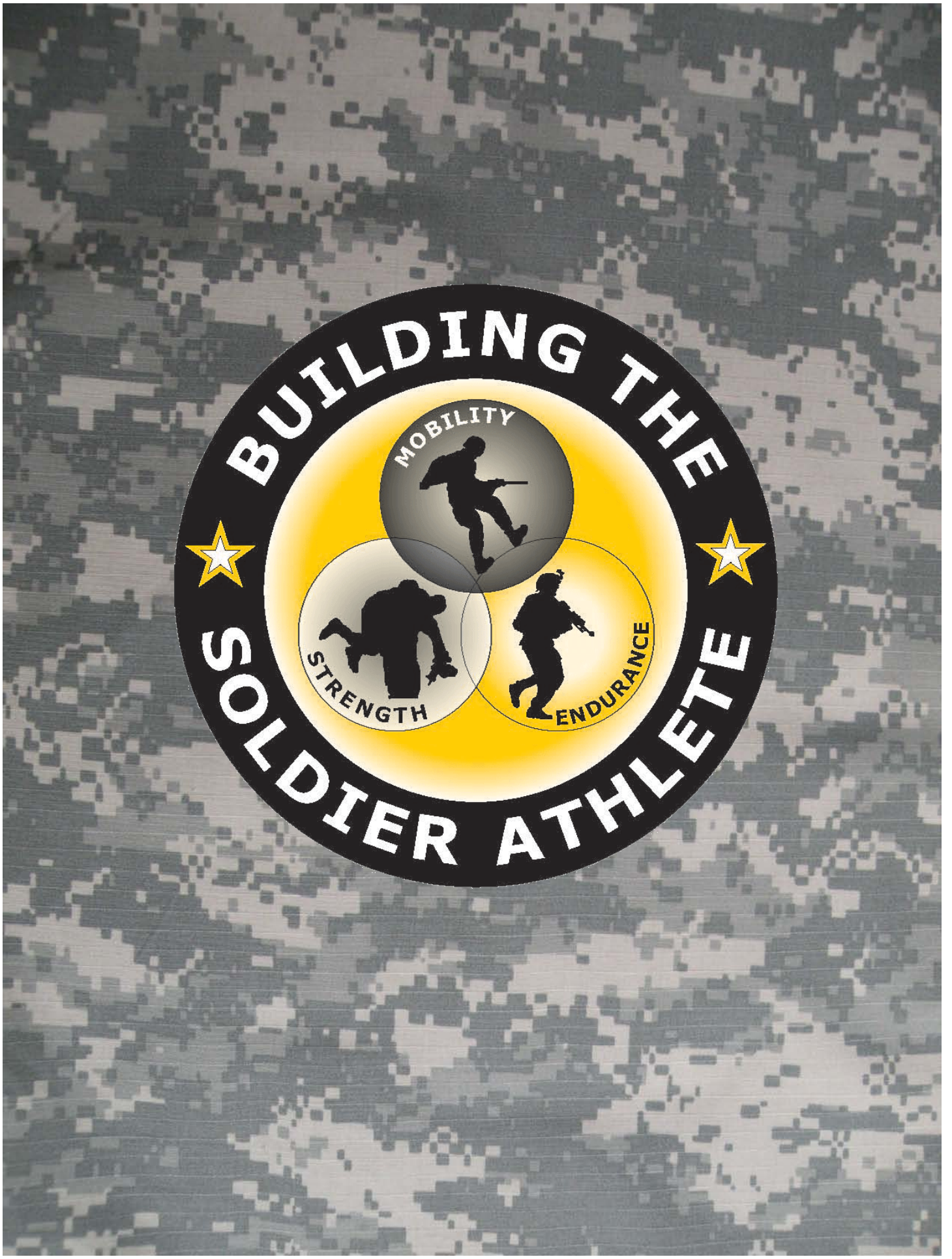
[12] Munn J, Herbert RD, Hancock MJ, Gandevia SC. Resistance training for strength: effect of number of sets and contraction speed. *Medicine & Science in Sports & Exercise*. Sep 2005; 37(9): 1622-1626.


BUILDING THE
SOLDIER ATHLETE
MOBILITY
STRENGTH
ENDURANCE