NAVY'S
PRE-INDIVDUAL AUGMENTEE
COMBAT TRAINING GUIDE

Developed By: OPNAV N135 Physical Readiness Program

Equipment Wear and Injury Prevention

Kevlar Helmet: The Kevlar helmet is approximately 3 lbs, therefore creating an additional workload for the neck musculature during extended periods of wear. It also provides resistance to the neck when the individual is trying to maintain an "eye level" position" during certain combat training activities such as basic marksmanship. When an individual is in the prone supported/unsupported position, they must use their neck extensors (muscles on the back of the neck) to look forward at the target and the additional weight of the helmet provides additional resistance to the neck. If the neck muscles are not strengthened adequately, not only will they fatigue early and reduce the individual's ability to perform certain combat training activities, but it may also result in injury, muscle soreness, or tension headaches. Since the neck flexors (front of the neck) are normally weak in most individuals due to their "forward head" posture, this training guide will also focus on strengthening this muscle group during the Pre-IA Combat Training Program.

Interceptor Body Armor (IBA): Interceptor body armor may weight anywhere from 25-40 lbs depending on the size of the vest, how many ballistic plates are inserted, if all the attachments (groin, throat, and axillary protectors) are worn. The average weight of a size medium vest with all plates inserted is approximately 30 lbs. Ensuring proper wear, and how to don/doff (put on and remove) this piece of equipment is very important for overall injury prevention. When an individual first reports to IA training, the support personnel and drill sergeants will assist the member in selecting the right size IBA. In addition to selecting the correct size IBA, it is also important to use proper "cinching" techniques to achieve a snug fit of the IBA to reduce excessive movement during combat training activities. Any additional movement may put strain and stress on the body's musculature and joints, therefore causing injury to the individual.

Since the IBA is heavy, the individual does want to put all of the weight of the vest on an outstretched arm or it could cause an excessive downward force and result in a shoulder injury, such as a rotator cuff tear. The best method to use to put on the IBA would be to have another individual assist with this task. They could hold the IBA while the individual slowly threads each arm thru the vest and the shoulder would not encounter any additional forces. Unfortunately, this method will not always work because an individual also needs to know how to do this task by themselves and also in a decreased amount of time. The next best method would be to place the vest on top of a platform or wall where you can back up into the arm holes so you do not put any stress on the muscles.

If the individual is by themselves, they can hold the vest above shoulder level and thread the first arm thru the arm hole. The weight of the vest should then rest on the upper trazpezius muscle group (by the neck) and not below the shoulder joint on the

upper arm. This location will prevent additional stress on the structures within the shoulder joint. The individual with then take their other arm and thread it thru the other side of the vest and proceed on with the rest of the steps to ensure a snug fit of the IBA. When taking off the IBA, they will reverse the order of the sequences they used to put the piece of equipment on.

Weighted Vest with Exercise: To prepare the body for the weight of the Interceptor Body Armor, individuals will wear a weighted vest during various activities of combat training. Even though the vest will put additional stress on the joints of the lower body during high impact activities (feet leave the ground such as jumping activities), it is necessary to perform these activities to simulate the training evolutions the individual will encounter during combat training. Several MWR locations have the weighted vests available or they can be purchased on the internet or at an exercise store. The weight of an exercise vest could range from anywhere from 20-70 lbs. We recommend that the individual uses a vest that has interchangeable weights so they can progressively add weight as their body gets accustomed to the vest.

Combat Boots: The average weight of the combat boot is 4 lbs and varies depending on shoe size and company. Since the boot is more restrictive and weighs more than a running or cross training shoe, if an individual does not train properly prior to combat training activities, they will be more susceptible to lower extremity injuries such as shin splints and plantar fasciitis. Just like any new pair of shoes, the individual should slowly introduce their body to the combat boot by wearing them for short periods of time and gradually increasing the duration of wear and type of activities they perform while wearing them. A good guideline would be to start wearing the boot for 1 hour increments and only perform low impact activities (where the feet remain on the ground and there are no jumping activities) during the first week. The individual will then gradually increase the time of wear by one hour increments and the amount of high impact exercises they engage in on a weekly basis.

In addition to this, some individuals may also benefit from additional foot orthotics placed within the boot. Over the counter arch supports will assist those members with flat fleet (low arches) and will provide additional contact area for the bottom of the foot during certain activities. Heel Cups will provide additional shock absorbing qualities for the heel and this is extremely important during high impact activities such as jumping off of the humvee or participating in plyometric exercises (explosive lower extremity exercises). The individual should also wear a pair of heel cups within their gym shoes while performing some of the higher impact activities for the same reason.

In order to prevent to reduce the incidence and severity of shin splints, all individuals should initiate Tibialis Anterior strength exercises (provided in the injury prevention section) several weeks prior to reporting to IA training in order to build up the shin muscles so they can accommodate for the extra weight of the boot during the combat training activities.

Low Ready Position and Wrist Pain: When an individual is in the low ready position, they are holding the M 16 pointed toward the ground with the non-firing arm in a "palms up" position with the wrist in maximal supination (palms up and turned towards the outside of the body). This position will cause moderate discomfort in most individuals because they don't engage in this type of wrist range of motion throughout their normal daily routines. They may approach this position as they attempt to open a door knob, but they do not hold it at the end range position for a prolonged period of time and provide additional weight to the joint like they do when holding the M 16. In order to prepare the wrist for this type of activity, it is recommended that the individual participates in wrist strengthening exercises 2-3 times a week starting at least 12 weeks prior to IA training. The wrist exercises they should perform are listed below in the injury prevention section as "Wrist Strength Pronation/Supination". In addition to these exercises, they should also load the joint into maximal supination for prolonged periods of time in order to prepare the wrist for this type of activity during long road marches. They can start off by holding a 3-5 lb weight and gradually increase the weight every other week as the body accommodates to this additional stress. The non-firing arm should simulate holding the M 16 when practicing this activity. This can be done by keeping the elbow tucked in by the side, and lowering the forearm so the elbow is at approximately 135 degrees (mid way between the forearm being parallel to the ground and perpendicular to the ground), and taking the wrist and going into maximal supination (rotate the wrist so the palms is up and rotate it further so it is facing the outside of the body). The individual will then hold the hand weight or use a body bar to load the wrist in this position. Beginners should start at 30 second increments. Once their body adapts to this new stress, they can then increase the time of each repetition by 30 adding second increments until they can hold that position for at least 5 minutes non-stop. This exercise should be done every other day for the first 2 weeks and then the individual can participate in this activity on a daily basis to ensure maximal benefits. They can also gradually increase the weight by 1/2 lb every week to progressively provide an overload to the wrist joint. They should not exceed 8 lbs though, since this is heavier than the weight of the M 16. The individual should also use body pain and discomfort as a guideline for exercise progression.

Low Ready Position

Injury Prevention Exercises

<u>Rotator Cuff Strengthening</u>: The rotator cuff is a group of 4 muscles that provide stability and strength to the shoulder joint. If these muscles are weak, the individual is more susceptible to shoulder injuries and dislocations. The rotator cuff also assists the shoulder joint in performing the following actions: external rotation (ex: cocking up for a baseball pitch), internal rotation (ex: release phase of a pitch), and abduction (taking the arm away from the body). Due to these actions, a strong rotator cuff is beneficial during throwing and lifting activities, and will also assist with shoulder stabilization during marksmanship activities.

1) **<u>External Rotation:</u>** With your elbow bent to 90 degrees, hold your forearm parallel to the ground with your thumbs up. Your elbow should be tucked in by your side and your fist should be pointing forward. Take a piece of resistance tubing and pivot at the elbow to pull the tubing away from the body. At the end range of this motion, hold it for 1-2 seconds and slowly return to the starting position. Repeat this exercise for 15-20 repetitions for 3-4 sets. This exercise will strengthen the muscles of the rotator cuff on the back side of the shoulder.

Start Position

End Position

2) **<u>Internal Rotation:</u>** This exercise begins in the same position as the external rotation exercise. Instead of pulling the tubing away from the body, you are going to pivot at the elbow and pull the tubing inward until your forearm is close to your abdomen or chest area. Once you get to the end range, hold this position for 1-2 seconds and slowly return to the start position. Repeat this exercise for 15-20 repetitions for 3-4 sets. This exercise will strengthen the rotator cuff muscle on the front side of the shoulder joint.

Start Position

End Position

Neck Strength: The neck musculature needs to be strong in order to carry the extra weight of the Kevlar helmet and also to maintain an extended (backward position) during prone on belly activities where you need to keep a "level eye". Please note that you do not want to use excessive weight when performing these exercises or you will put additional stress on the joints and vertebral disks within the neck. You will use your own hand (with an isometric hold) or gravity to provide the resistance. Once the strength within your neck musculature increases, you can proceed from isometric exercises (the easiest form of exercise because the joint does not move), then to against gravity exercises, and finally to against gravity while wearing a Kevlar helmet.

1) **Neck Flexion (Isometric Hold):** While sitting in a chair, place your fingers on your forehead and gently provide resistance. Your fingers should resist your head from moving forward (pretend you are trying to bring your chin to your chest). Provide resistance to your forehead for 5 seconds and relax. This is one repetition. Repeat for 3 sets of 15 repetitions.

2) **Neck Flexion (Against Gravity):** While lying on the ground with your face up, slowly lift your head up as if you are trying to touch your chin to your chest. As you approach the end range position (where you can't go any further) hold it for 2 seconds and slowly return to start position. Do not let your head rest on the ground (it should be in line with your body and your eyes looking up at the ceiling). This is one repetition. Perform 3 sets of 15 repetitions.

3) **Neck Flexion (Against Gravity with Kevlar Helmet):** This exercise is performed in the same sequence as the "against gravity" exercise but this time you are wearing a Kevlar helmet for additional resistance. Do not add the helmet until your muscles are strong and you have been performing against gravity for 6-8 weeks.

4) **Neck Extension (Isometric Hold):** While sitting in a chair, place your fingers on the back of your head and gently provide resistance. Your fingers should resist your head from moving backwards (pretend you are trying to bring your head back like you are looking towards the ceiling). Provide resistance to the back of your head for 5 seconds and relax. This is one repetition. Repeat for 3 sets of 15 repetitions.

5) **Neck Extension (Against gravity):** While lying on the ground with your face down, slowly lift your head up and backwards as if you are trying to look straight ahead. As you approach the end range position (where your eyes are parallel to the floor) hold it for 2 seconds and slowly return to start position. This is one repetition. Do not let your head rest on the ground (it should be in line with your body and your eyes looking directly at the floor) in between repetitions. Perform 3 sets of 15 repetitions.

6) **Neck Flexion (Against Gravity with Kevlar Helmet):** This exercise is performed in the same sequence as the "against gravity" exercise but this time you are wearing a Kevlar helmet for additional resistance. Do not add the helmet for additional resistance until your muscles are strong and you have been performing against gravity for 6-8 weeks.

Muscle Imbalances in Chest: In the majority of individuals, the chest muscles are overdeveloped and tight while the back muscles are weaker. This muscle imbalance leads to a forward shoulder and kyphotic (curve in the upper back) posture which could lead to neck, upper back and shoulder pain. Due to the nature of their job, individuals who work at the desk are more prone to developing this type of posture and muscle imbalance. It is therefore important to work out these muscle imbalances prior to wearing the IBA, since this protective gear will put additional stresses on the chest and back musculature if an individual has poor posture and it forces them into an "unnatural postural". You can improve these muscle imbalances by performing the following exercises in addition to performing rhomboid and serratus anterior strengthening within in the gym:

1) Upper Trapezius Stretch: The upper trapezius muscle is usually overdeveloped and tight in most individuals and this leads to raised shoulder blades. If these muscles are tight when an individual wears the IBA, the additional weight will put a downward pull on these muscle groups. This action will put the trapezius muscle group on a prolonged stretch beyond their normal length, which may lead to upper back/neck pain. Since this muscle group attaches to the neck and shoulder blade, the best way to increase flexibility and to stretch is to provide distraction (pulling movement) to the arm while also engaging in forward neck flexion. You will begin this stretch by pulling on your right arm until you feel a slight tension. Slowly bring your chin forward and on a diagonal to the left side of your chest. You should feel the stretch on the right side of your neck. Hold the stretch for 30 seconds and perform 3-5 repetitions, twice a day, at least 3 times a week. Please note that the best time to stretch a muscle group is when the muscle is already warmed up.

Back View of Stretch

Front View of Stretch

2) Chest Stretch: Perform the chest stretch by placing your upper arm parallel to the ground (with your forearm perpendicular to the ground so your elbow is bent to 90 degrees) and against the corner of wall. Slowly rotate your body until you feel a stretch in your chest. Hold the stretch for 30 seconds and repeat 3-5 repetitions, twice a day, at least 3 times a week. If you do not have a wall available, you could also perform the chest stretch by lacing your fingers on the back of your head and gently pull your elbows back behind you to open up your chest musculature.

Corner Chest Stretch

Self Chest Stretch

3) Postural Strength Exercises: This exercise will be used to strengthen up the mid and lower trapezius muscles, which help hold the shoulder blades back to promote good posture. You will start this exercise by performing a pelvic tilt against the wall (flatten your low back so there is no open space or curvature between your low back and wall) and your feet are shoulder width apart with a slight bend in your knees. With your elbows bent to approximately 90 degrees, rotate your forearm out so they are touching the wall. Your elbows should be at approximately your lowest rib. Perform a "snow angel" by sliding your forearm up the wall until both hands/fingers touch in midline over your head. While you are performing this motion, concentrate on maintaining that pelvic tilt and squeezing those shoulder blades together. Once your hands reach midline, slowly lower them back down to the starting position. This is one repetition. Perform 3 sets of 15 repetitions 3 times a week.

Start Position

End Position

Additional note: members with tight chest muscles will have difficulty maintaining their forearm on the wall while performing the overhead motion. They will need to increase the flexibility of their chest muscles and the range of motion in their shoulders to get maximal benefits from this exercise.

Tibialis Anterior Strength for Shin Splints: Some individuals develop shin splints due to muscles imbalances within the lower leg. Some other causes of shin splints are: inappropriate foot wear (old shoes or wearing the incorrect type of shoe for the training being performed), genetics (arch type), and a sudden increase in training. Anterior shin splints, where the pain is located in the front of the leg on the shin bone, may be alleviated by strengthening up the tibialis anterior muscle group. The tibialis anterior is used to bring the foot back towards the shin and also prevents excessive "slapping of the foot" onto the ground during running activities. The best way to strengthen this muscle group is by performing a negative motion of dorsiflexion (where the toes are lifted toward the shin) motion.

This exercise will be performed using resistance tubing. Tie the tubing around a pole or object so you can loop the other end around your foot while you are in a long sitting (leg straight in front of you) position. Bring your toes back towards your shin until you are at end range of the ankle until you feel maximal resistance. Hold for 2 seconds. Slowly release the hold for 3 counts (or a negative count) back to the starting position. This is one repetition. Perform this exercise for 3 sets of 15-20 repetitions, 3 times a week.

Start Position-Toes Pointed

End Position-Toes Dorsiflexed

<u>Wrist Strength for Pronation/Supination:</u> This exercise will be used to strengthen up the wrist musculature to prevent additional pain during the low ready position. You can either use resistance tubing or hand weights to perform this exercise. Start with your elbow bent to 90 degrees and tucked in by your side. Your hand should be in a fist with your thumbs up. This is called the neutral position. Grab the weight or tubing in your hand. You will first perform "supination" by rotating your hand to the "palms up" position and back to the neutral or start position. This is one repetition. To perform "pronation", you will start this exercise in the neutral position (thumbs up) and rotate your wrist until your palm is facing down towards the ground. These exercises, both pronation and supination should be performed for 3 sets of 15 repetitions for 3-4 sets at least 3 times a week.

Full Pronation

Full Supination

Standard Set of Exercises

Core Strength:

Pelvic Tilt: Perform this motion by laying flat on the ground and flattening your back so the natural curve in your back (lordosis) goes away. If you perform this motion correctly, you should not be able to slide your hand behind your back. This is the basic move for some of your core strength exercises and it will also help engage your deep pelvic musculature and increase the difficulty of your core exercises.

Prior to Performing Pelvic Tilt (Normal Curve in Back Shown)

Individual in Full Pelvic Tilt (No Space between Back & Floor)

Basic Crunch: With both feet on the ground and approximately 10 inches away from your buttocks, cross your arms across your chest. Gently lift your shoulder blades off of the ground, performing approximately the first 30% of a full Navy Curl-up. While bringing your elbows towards your thighs, contract your abdominal muscles to engage the rectus abdominis muscle. If you want to make this exercise more difficult, perform a pelvic tilt during this motion or increase the lever arm by placing your arms behind your heads or holding a medicine ball. Perform 15-20 repetitions for 3-4 sets.

Start Position of Basic Crunch

End Position of Basic Crunch

Bicycle: While lying on you back, place your hands behind your neck but do not pull forward. Simultaneously take your right elbow towards your left knee then alternate to the opposite side where your left elbow approximates your right knee. This is one complete repetition and this exercise will target the internal and external obliques. Perform 15-20 repetitions for 3-4 sets.

One Side of the Bicycle Exercise

Other Side of the Bicycle Exercise

Reverse Crunch: While lying on your back, bend your knee to 90 degrees so your lower leg is parallel to the ground. Gently lower your legs so your feet are 2" above the ground and you engage the lower abdominal muscles. To increase the difficulty of this exercise, try to maintain a pelvic tilt while you are performing the reverse crunch. This exercise will engage the rectus abdominis and hip flexor musculature. Perform 15-20 repetitions for 3-4 sets.

Start Position of Reverse Crunch

End Position of Reverse Crunch

Injury Prevention Note: Since this exercise does not but additional stress on the low back, it is the preferred method used versus using the "flutter kick" exercise for lower ab and hip flexor strengthening. If members do continue to use the "flutter kick" have them place their hands under their buttocks and only perform low repetitions of this exercise. If members perform too many "flutter kicks" and they have weak low back and abdominal musculature, this will increase their risk for injury.

Standing Side Crunch: While in the standing position, take a weight or sand bag and perform a side crunch to the opposite side you are holding the weight. This exercise engages the internal and external oblique muscles. Please note you do not want to use a lot of weight with this exercise or you may injure yourself. The goal f this exercise is to use good technique and to perform high repetitions with low weight for muscular endurance. Perform 15-20 repetitions for 3-4 sets.

Start Position

End Position

Superman's: While lying on your stomach, bring both arms forward and place them directly overhead so they are by your ears. Gently lift your right arm approximately 6 inches as you lift your left leg 6 inches. Repeat this sequence to the opposite side by gently lifting your left arm as you raise your right leg. This is one repetition. This exercise increases the strength of the deep back musculature and is important in back injury prevention. Do not lift both arms and legs at the same time or this may cause additional stress and pain in the low back region. Perform 15 repetitions for 3 sets.

Superman Exercise

Basic Bridge: While lying on you back, gently lift your hips so your thighs and upper body is in a straight line from your knees to your shoulders. Not only should you feel a gentle stretch in the hip flexor region (in front of hip joint), but more importantly, you will be strengthening the deep back muscles, the buttock and hamstrings. If you want to engage the buttock and hamstrings more, dig your heels into the ground. Hold the bridge for 10 seconds and repeat 10 times. Your goal will be to increase the time up to 30 seconds for each hold.

Basic Bridge

Bridge with One Leg Extended: Start this exercise by performing a basic bridge. Slowly take one leg and fully extend (straighten it out) so that it is in a straight line from your foot to your shoulder. Hold for 5-10 seconds and relax. As your core strength improves you can increase the amount of time you perform this exercise with one leg extended up to 30 seconds on each side. Repeat this exercise 5-10 times on each leg.

Bridge with One Leg Extended

Bridge on Exercise Ball: This exercise is performed by doing a basic bridge on an exercise ball. Make sure the exercise ball is secured in a corner as you place both of your feet on the ball. Gently raise your buttock so your thighs are in straight line with your upper body. Since your feet are on an unstable surface, it increases the difficulty of this exercise. You can also perform a One Leg Bridge on the exercise ball if you are advanced.

Bridge on an Exercise Ball

Basic Plank: Start this exercise by lying on your stomach and propping up on your elbows. Slowly straighten your back so it is in a straight line from your shoulders to your feet. By lifting your butt or sagging your back, you will not engage your core musculature and this is considered a "cheat method". Technique is very important with this exercise. Start off by holding this exercise for 10 seconds for each repetition. Repeat 5-10 times. Gradually increase the time until you can hold it beyond 30 seconds.

Basic Plank Position

Basic Plank with Hip Extension: While performing a basic plank, gently extend (lift up) one of you legs approximately 6 inches and hold it there for the amount of time you are performing the plank. Not only does this increase the difficulty of the exercise, but it also engages the deep back musculature, the buttocks, and hamstrings.

Basic Plank with Hip Extension

Side Plank: While lying on your right side, bend both of your knees so they are directly behind you (at 90 degree bend). Prop up on your right elbow and gently lift your body so it is in a straight line from your shoulders to your knees. Hold for 10 seconds and repeat for 5-10 repetitions. Your goal is to increase the time to 30 seconds for each repetition.

Side Plank-Beginner Level

Advanced Side Plank: Increase the difficulty of the basic side plank by extending your right arm so it is completely straight and perpendicular to the ground and extending your legs so they are straight from your hips to your feet. Your feet should be staggered to increase your base and assist with balance. Not only does this exercise increase your core strength, but it also requires strength within your shoulders. Perform this exercise for 10 seconds and gradually increase the time up to 30 seconds as your strength improves. Repeat for 5-10 repetitions.

Advanced Level Side Plank

Side Plank with Twist: Start this exercise by performing an advanced side plank. Take your arm that is in the up position and gently place it behind your neck. With your elbow bent, bring it toward the ground by twisting your torso to engage the obliques. Slowly return to the up position. This is one repetition. This exercise is an advanced core strength exercise and should only be performed by those individuals who have mastered the advanced side plank. Perform 15 repetitions for 3 sets on each side.

Start Position

End Position

Technique Note: When performing this action, ensure you are tightening up your core musculature as you go from the up to the down position. Do not initiate this exercise if you cannot hold the advanced side plank for 30 seconds plus.

Wood Chop with Medicine Ball or Sand Bag: While performing a partial lunge, take a sand bag or medicine ball and hold it above your head and towards the right side of your body. While simultaneously deepening your lunge, perform a diagonal movement with your arms in front of your body to the lower left side of your body. This is one repetition. Repeat this exercise to the opposite side to balance out the body. Perform 15 repetitions for 3 sets on each side.

Start Position

End Position

Rotational Movement for the Core: This exercise will introduce the core to rotational movement and will also provide resistance while performing a dynamic core exercise. Tie a piece of tubing onto a pole and make sure it is slightly above hip level. Stand facing forward and the tubing should be off to your right side. Take the tubing in your hand and perform a rotational movement to the left while your hips stay "squared up" and facing front with a slight bend in your knees. As you hit end range, hold for 2 seconds and slowly return to the starting position, where your entire body is facing the front. This is one repetition. Perform this exercise to the opposite direction by facing backwards. Repeat 15 repetitions for 3 sets on each side.

Start Position

End Position

Spiderman Push-up: While performing a basic push-up, do a simultaneous hip flexion (with your knee pointing out) to the right side of your body so your right knee approaches your right elbow. This is one repetition. By performing this exercise, not only do you engage the hip flexor musculature, but it also requires more core strength than the regular push-up. Perform 5-10 repetitions for 3 sets on each side.

Start Position

End Position

Push-Up Side Plank: Perform this exercise by performing one full push-up and transitioning into a left advanced side plank. After the left side plank, proceed into the rest position of a push-up and perform another push-up. The next sequence of this exercise would involve transitioning into a right advanced side plank and returning to the rest position of a push-up. This entire sequence is one repetition. This is an advanced exercise that requires dynamic core and upper body strength. Repeat the entire sequence for 10-20 repetitions.

Position #1

Position #2

Position # 3

Position #4

****Please note: To finish the sequence, Position 5-8 would be the same sequence as 1-4 but you would perform a right side plank.**

Shoulder Stabilization:

Push Up in Rest Position: Start this exercise as if you were going to perform a push-up. As you get in the "Rest Position" for the push-up, with the body in a straight line from the shoulders to the feet, gradually increase the amount of time you are in this isometric hold to increase the strength of the shoulder stabilization muscles and your core strength.

BOSU Shoulder Stabilization: Flip the BOSU exercise tool upside down so the curved portion is on the ground. Place your hands on the outer portion of the flat platform and assume the rest position of the push-up. Since you are performing this exercise on an uneven surface (BOSU) it will be more difficult. Gradually increase the amount of time you perform this isometric exercise. As you perfect the technique in the rest position, practice rocking side to side on the BOSU to advance this exercise and to engage the shoulder, upper back and core musculature. Perform this exercise for 30-60 seconds increments for 5 repetitions.

Beginner Level-Steady BOSU

Rocking the BOSU

Walking Plank: You will begin this exercise in the "rest position" of a push up. You will then transition into a plank position by bending your left elbow first and then your right elbow. Once you assume the plank position, you will then transition back to the "rest position" of the push-up by straightening your right elbow first and then your left elbow. This entire sequence is one repetition. It is important that the body remains in a straight line from your shoulders to your feet to ensure you are also engaging your core musculature. Repeat this exercise for 30-60 second increments.

Position #1

Position #2

Position #3

Position #4

Position #5

<u>Push-Up Circle:</u> The goal of this exercise is to improve your shoulder stabilization by performing multiple push-ups and maintaining your form as your transition from one position to another. Your feet will remain stationary and act as a pivot point as you perform a complete circle of push-ups. Imagine your first push-up is at the 12 o'clock position. After you complete the first repetition and you are in the "rest position" you are going to take a "side step" with your right and then your left hand to assume the rest position at the 2 o' clock position. Your body should remain in a straight line from your shoulders to your feet as you transition to this next position. Complete another push-up and proceed to your right as you did before towards the 4 o'clock position. Continue this sequence until you complete one entire circle of push-ups. To ensure your body is balance, also perform this exercise to the left (counter clockwise) so that you have to lead your transition with the left arm vs. the right.

Upper Body Strength

Basic Push-Up: Begin this exercise in the "up position" where your body is in a straight line from your shoulders to your feet. Slowly lower your body until your upper arm is parallel to the floor. This is the "down position". Return to the "up position" to complete one repetition. By using more of a "wide hand stance" you will be emphasizing more of the chest muscles and by using more of a "narrow hand stance" you will be emphasizing more of your tricep (upper arm) muscle group. Vary the difficulty by adding resistance (tubing, partner applied resistance) or the angle you are performing the push-up (incline makes the push up easier while a decline makes the push up more difficult). You can also perform a decline push-up by placing your feet on a bench or on an exercise ball. Perform this exercise for as many repetitions you could perform within a one minute time period and gradually build up to 2 minutes.

Functional Push-Up: This exercise is performed in the same sequence as a basic push-up except for the hand position. You will place you hands in a staggered position approximately shoulder width apart. One hand should be on the floor a few inches above shoulder level (up position) and the other hand should be a few inches below (down position) shoulder level. Practice this exercise with the right hand in the "up" position for a certain number of repetitions, rest, and change your hand position so your left hand is in the "up" position to ensure a balanced sequence of exercises.

Hand Position for Functional Push-Up

Push-Up with Uneven Surfaces: Increase the difficulty of the basic push-up by placing one hand on a book or sand bag. By placing this hand on an item, it forces it to be at a mechanical disadvantage and makes the hand on the floor perform more work.

Start Position

End Position

Push-Up on Ball: Perform a basic push-up on the curved side of a BOSU or on an exercise ball, or sand bag. By performing this exercise on an uneven surface, not only does it make it more difficult, but it will also challenge your scapular stabilizer (upper back) muscles.

Start Position

End Position

Pull Ups: Practice this exercise using various hand grips (over and under hand) and at different hand widths (narrow and wide) to engage different muscle groups and vary the difficulty of this exercise. If a member cannot perform a basic pull up, they can practice this activity on a weight-assisted machine within the gym. Pull-ups will assist the Sailor for combat training activities where they need to pull their body weight up to a higher level surface.

Dips: This exercise could be performed using parallel bars or by using a chair or bench. If you cannot perform this exercise within parallel bars using your own body weight, you can use the weight-assisted dip machine within a gym. The basic dip will be used to strengthen the upper body, especially the triceps and back musculature. Start this exercise with your arms straight (with a slight bend in the elbows; do not lock your elbows out) and slowly lower your body until your upper arms is slightly above parallel to the floor. **Do not go too deep (where your upper arm goes beyond parallel) or you will increase your chance of developing a shoulder injury.**

Upper Arm Parallel to Deck
(Do not go any Deeper)

<u>Anterior Deltoids/Front Shoulder Raises to Assist with Reflexive Fire:</u> One of the best ways to target the anterior (front part of the shoulder) deltoids is to perform a front raise. You can use dumb bells, sand bags, or resistance tubing to increase the difficulty of this exercise. Start this exercise with your arms by your side. With your palms facing down and thumbs pointing towards each other, gradually raise your arms to shoulder level. This is the up position. Hold for 2 seconds and return to the start position. Ensure good technique by performing this exercise slowly and by using a 3 count down and a 1 count up. Once you build up your muscular endurance and you perfect your technique, you are going to simulate reflexive fire drills where the speed of the exercise will increase to a one count up and a one count down.

Start Position Dumbbells **End Position Dumbbells**

Body Bar or M 16 Start **Body Bar or M 16 Finish**

Injury Prevention Note: If you are experiencing shoulder pain with this exercise, try pulling your shoulder blades back (by pinching them together) to increase the space within your shoulder joint. Also perform rotator cuff strengthening at least 3 times a week to improve shoulder stabilization and to reduce excessive movement within this joint during a dynamic exercise.

Lower Body:

Squats: Perform this exercise by placing your feet slightly wider than shoulder width apart. Slowly lower your buttock until your legs are parallel to the ground. Your knees should remain above your ankles and should not move forward past the toes. The majority of movement should be performed like you are "sitting back" into a chair. By digging your heels down into the ground and lifting your toes up, you will put more focus on your buttock and hamstrings than your quadriceps. Perform 15-20 repetitions for 3-4 sets if you are building for muscular endurance and 8-12 repetitions for 4-6 sets if you are building for muscle mass. Since you will need to use leg strength during casualty carrying and other activities, make sure you also perform this exercise with heavy weights at least once a week.

Front View Start

Side View Finish

Deep Squats: Even though this exercise puts excessive force at the patellofemoral joint (where the knee cap meets the upper leg bone), this exercise needs to be performed to improve functional performance and to simulate certain combat training actions. This exercise will require and a certain range of motion at the hip, knee and ankle joint, so your flexibility is important to ensure good technique. Since this exercise does put additional force at the knee joint, do not perform excessive amount of repetitions or sets. You will start this exercise in the same position as the basic squat and will go down into a deep knee bend until you are at maximal knee flexion. Once you reach this position, you will slowly return to the start or standing position.

Deep Squat

Lunges: This exercise is performed by placing one foot in front of another so when you go into the down position, both knees will be at approximately a 90 degree angle. The front leg will be performing the majority of the work and the knee joint should remain above the ankle joint to reduce injury and to get maximal benefits. A member may have difficulty maintaining the 90 degree angle in the back leg if their hip flexors are tight. To put more emphasis on the buttock and hamstrings, drive the heel of the forward leg into the ground. Beginners should start with a stationary lunge and then progress to a walking lunge once they perfect their form. Perform 15-20 repetitions for each leg for 3-4 sets.

Start Position

End Position

Side Step with Tubing: This exercise will be used to perform a dynamic lateral movement and to strengthen the outer portion of the thigh which is essential for pelvic stabilization and reduction of injuries during running activities. Start this exercise in a standing position with a slight bend in your knees. Hold both ends of the tubing and loop it under your feet. Take the tubing and perform an isometric bicep hold (elbows are bent to 90 degrees) to increase the tension and slowly widen your stance beyond shoulder width apart until you begin to feel additional tension in your outer thighs. Perform 10-15 side steps in the right direction and then 10-15 steps in the left direction. This is one set of these exercises. Perform 3-4 sets. You can increase the difficulty by increasing the tension in the tubing by using a different color band or by taking wider side steps.

Position #1

Position #2

Position #3

Adductor Strength: The adductor, or inner thigh, is important for pelvic stabilization and also acts as a secondary hip flexor (brings the leg forward) during marching and running activities. Having strong adductors will prepare you for endurance activities, such as road marches, and assist with injury prevention. This exercise could be performed in the side lying or standing position. With the leg you are strengthening, tie the tubing (the other end of the tubing is tied around a pole) around the ankle and bring the entire leg (with it being straight) towards the midline of the body to target the inner thigh muscles. The further away from the body you place the tubing (ex: ankle vs. thigh) the more difficult the exercise will be. If you do not have resistance tubing, you could perform this motion in the side lying position and use gravity, an ankle weight or your boot for resistance. Perform this exercise for 15-20 repetitions for 3-4 sets.

Side Lying Start Position

Side Lying End Position

Standing Tubing Start Position

Standing Tubing End Position

Abductor Strength: The abductors, or outer thigh muscles, is important for pelvic stabilization and also acts as a secondary knee flexor during marching and running activities. Having strong abductors will help prevent knee and hip injuries during prolong marching and running activities. This exercise could be performed in the side lying or standing position. With the leg you are strengthening, tie the tubing around the ankle and bring the entire leg (with it being straight) away from the midline of the body to target the outer thigh muscles. The further away from the body you place the tubing (ex: ankle vs. thigh) the more difficult the exercise will be. If you do not have resistance tubing, you could use gravity, an ankle weight or your boot for resistance. Perform this exercise for 15-20 repetitions for 3-4 sets.

Side Lying Start Position

Side Lying End Position

Start Position for Standing Tubing

End Position for Standing Tubing

<u>Step Up:</u> Place the right foot on a platform so the knee is directly above the ankle joint. Step up onto the platform so the left foot is on top of the platform as well. Return to the starting position by leading with the left foot. The right foot should remain on the platform at all times (versus alternating feet in the up and down position) to reduce impact on the knee joint. Repeat this exercise on the other leg by placing the left foot on the platform and repeating the sequence. Perform 15-20 repetitions for 3-4 sets on each leg.

Position #1

Position #2

Position #3

Step Up with Hip Flexion: This exercise is performed in the same sequence as the basic step up except you will add hip flexion (bringing the knee to the chest) at the end of the exercise, with the leg comes from the ground position as you are transitioning to the top of the platform. Repeat 15-20 times for 3-4 sets each leg.

Position #1

Position #2

Position #3

Calf Raise: This exercise will be used to increase the muscular endurance of the calf muscles to decrease injury and fatigue during long distance road marches and running. This exercise could be performed on two legs, or on one leg (uniped). Since you are trying to build you muscular endurance, perform high repetitions (15-20 reps) for 3-4 sets. Also perform a negative (three counts down and one count up) to get maximal benefits from this exercise. You can use your own body weight, weight machines, a body bar, holding weighted sand bags, or partner applied resistance (on your shoulders) for resistance.

Functional:

Squat and Press: Start this exercise in deep squat position. Take the medicine ball or sand bag and pull/hold it close to your chest. Straighten your legs and transition to a standing position with a slight bend in your knees. The next sequence of the exercise involves taking the medicine ball/sand bag and performing a military/overhead press until it is completely overhead and your arms are extended. Once you reach this position, hold the medicine ball/sand bag overhead for 3 seconds and reverse the sequence back to the starting position. This is one repetition.

Position #1

Position #2

Position #3

Position #4

Bent Over Row: With the torso flexed forward to 45-50 degrees, grab a weighted bar with an overhand grip. With your elbows tucked in, bend them and slowly to bring the bar back to your chest. While you are doing this movement, pinch your shoulder blades together to also engage your back muscles with this exercise. Hold this end position for 2 seconds and slowly release the weight back to the starting position. This exercise targets the back muscles and the biceps. Perform 15-20 repetitions for 3 sets for muscular endurance and 8-12 repetitions for 4-6 sets for muscle mass.

Start Position

End Position

**You can also perform this exercise by isolating one side of your back and doing single arm bent over rows. Use a bench or surface to support your upper body with the opposite arm. Your upper body should be parallel to the ground. With your elbow tucked in, slowly bring your elbow behind your body and lift the dumb bell/or sand bag towards your chest. Hold for 2 seconds and slowly return the weight to the starting position.

Line Pulling with Weight: In a partial squat position, simulate line pulling by using a line with weight attached to the end. To ensure upper body balance, perform this exercise to the front and to both sides of the body. You can also use resistance tubing where you have one end tied to a pole or another individual holding it for resistance.

Technique note: Make sure you rock your entire body instead of just using your arms to perform the work of line pulling. If you do not perform this action, your arms will fatigue early.

Step Up with Weight/Medicine Ball: This exercise will be used to prepare you for stepping up on a platform or humvee with a weighted item. You can increase the difficulty of this exercise by increasing the height of the step or increasing the weight being lifted. Dumb bells or a weighted medicine ball of various weights could be used during the step up, and it should also be performed with a weighted vest in the latter part of your pre-conditioning program. To decrease the amount of stress on the knee joints, you should not alternate feet while going up/down from the platform as explained in the basic step-up exercise. Your repetitions will be based on the amount of weight you use. The heavier the weight, the lower the number of repetitions you will perform.

Start Position

End Position

Body Rotation in Standing (Obliques): This exercise will prepare the upper body for rotational movements and will prepare you for working parties and training evolutions where you have to pass a heavy item from one individual to another down a line. You will perform this activity by standing with your feet slightly wider than shoulder width apart and with a slight bend in your knees. First without weight, you will simulate that you are passing an item at chest level from your left to your right. After performing 15-20 repetitions without weight, add weight (via sand bag or medicine ball) and perform this activity for another 15-20 repetitions or for a certain time period (ex: 1-2 minutes). This exercise could also be done as a partner exercise, where you stand back to back and pass the medicine ball around both bodies in a complete circle.

Position #1

Position #2

Position #3

Body Thrusts: This exercise will be used to prepare the body to go from a standing position to a position parallel to the ground and will ensure you are using good body mechanics in future combat training activities. It will also be used in the future as a transitional movement for house clearing procedures during urban operations. The basic movement is a modified 4-count body builder. Start in a standing position and perform a deep squat (first count), then kicks out your feet until you are in the rest position of a push-up (second count), the third count will bring you back into a deep squat and the last count (fourth count) will take you back into the standing position. Even though performing deep squats is not the best exercise for the knee joint, this movement is necessary to prepare you for the range of motion and functional activities you will encounter during combat training.

Position #1

Position #2

Position #3

Position #4 **Position #5**

Injury Prevention Note: Please not this exercise needs to be performed slowly with good technique. If you transition from the up/down position too quickly, you may get dizzy. Also, this exercise should be performed with low repetitions. The goal of this exercise is not to build endurance, but to ensure the member has good core and upper body strength to transition form one position to another.

Body Thrusts with Functional Push-Up: To perform this exercise you will first start off by performing counts one and two of the body thrust. You will then drop to the ground (so you are lying flat on the ground) and will then perform a functional push-up (one hand in front of the other) to get back into the rest position of the push-up position. The sequence of this exercise is to proceed onto count 3 and 4 of the body thrust exercise where you go into a deep squat and transition into the standing position. This exercise will also be used for house clearing procedures.

Chest Press: With a weighted bar, perform this exercise with a wide and narrow hand grip to emphasize different muscle groups (wide hand stance has more focus on the chest muscles while a narrow hand stance puts more emphasis on the triceps or upper arm muscles). Start by lowering the bar to your chest. Raise the bar until your arms are straight but have a slight bend in the elbows. Do not lock your elbows out. Hold this position for a 1-2 count and slowly lower the bar back to your chest for a 3 count. You can also perform this exercise by using a medicine ball or weighted sand bag. Using this alternate resistance training (medicine ball or weighted sand bag) methods will simulate everyday activities and is considered a functional chest press.

Start Position **End Position**

Military or Overhead Press: With a weighted bar, hold it with an overhand grip at chest level. Extend (straighten) both arms until you push the bar overhead with a slight bend in the elbows. Make sure you keep your elbows tucked in to emphasize the triceps to reduce the stress at the shoulder joint. Once you reach the top position, hold it for 1-2 seconds and slowly return to the start position with a 3 count down.

**You can also perform this exercise with a medicine or weighted sand bag where this activity would be considered a functional overhead press and will aid you in overhead activities during combat training activities or onboard a ship.

Start Position

End Position

Simulate Reflexive Fire: With you feet slightly wider than shoulder with apart and a slight bend in your knees, perform a partial pelvic tilt to engage your core. Take an 8 lb weighted bar (to simulate the weight of a M 16) and place the end of the bar in the pocket of your shoulder on your shooting arm. If you are right handed, your left hand should perform an underhand grip at the far end of the bar, while your right hand is positioned towards the near end. With the bar pointed at a 45 degree angle towards the ground, raise the bar so it is parallel to the ground, and simulate you are in the firing position. Repeat this exercise for 15-20 repetitions to build muscular endurance of the deltoids, which will assist in future endeavors during marksmanship and reflexive fire drills.

Start Position

End Position

Start Position **End Position**

<u>Simulate House Clearing Procedures:</u> This exercise involves series of sprints with weighted gear, transitioning from the standing to kneeling position, transitioning from standing to prone (on belly) position, and using the low ready position while posting guard and entering into an abandoned building.

1) **<u>Standing to Prone Position:</u>** To simulate house clearing procedures for looking under a door for possible encounters, you will perform the following exercise: From a standing low ready position, perform a partial body thrust so you are going from a standing position into a deep squat and then kicking your legs out so you are in a prone (on belly) position. Turn your head to the side to simulate you are looking under the doorway. Then perform a functional push-up (one hand in front of the other) to push yourself in the rest position of a push-up. Then perform a reverse partial body thrust to transition from the push-up rest position into a deep squat then into a standing position. This is one repetition. Please note: when you are first performing this exercise, start off slowly to ensure good technique and to prevent dizziness from transitioning too quickly from a down to up position.

2) **<u>Standing to Kneeling Position:</u>** To prepare the body for combat training activities during house clearing procedures, you will have to practice transitioning from a standing to kneeling position. In the low ready position, you will start this exercise off by transitioning from a standing position (with slight bend in knees) and put one leg forward like you are going to perform a stationary lunge. The next step is to go down like you are performing a lunge and proceed into a kneeling position where your knee touches the ground. The leg opposite of firing arm will be the leg in the front. The next step would be to reverse the sequence and get back into the standing position. This is one repetition. Have the member perform 10-15 repetitions for each set. If you want to make this exercise more difficult, have the member simulate firing after the kneeling position and prior to returning to the standing position. This will also engage the upper body in this activity.

3) **Sprint Series:** To prepare the member for speed during house clearing procedures, have them wear a weighted vest and perform series of 25-50 yards sprints during this exercise. This will simulate house clearing procedures in between multiple abandoned buildings.

4) **Backwards Step in Low Ready:** Members will practice stepping backwards (simulate performing watch from behind) while in the low ready position. This will prepare the muscle groups and coordination of this activity prior to engaging in a simulated house clearing exercise.

House Clearing Procedure Obstacle Course: To perform this exercise, utilize segments of sprints, backward and forward stepping in the low ready position, and transitioning from standing to kneeling, and standing to prone on belly exercises. If possible, utilize a building or corner to simulate the environment you will be performing this activity in during future combat training sessions.

On Knee Unsupported Position: You will practice this exercise to strengthen up your core strength during marksmanship drills and your ability to hold a weapon in a firing position for a prolonged period of time. This exercise will also require muscular endurance of the deltoid (shoulder) muscle group and will also utilize shoulder and scapular stabilization muscles in order to hold the weapon steady. In the kneeling position, put a knee forward (opposite knee from your firing arm) and use it as a base of support to stabilize the body from swaying side to side. This leg will also support your elbow of your shooting arm. You will be kneeling on the knee from the side you are shooting from. This knee can remain in the 90 degree bent position, or if you need more stabilization of your body, you can sit back on your foot (this will require additional flexibility from your ankle and knee joint. The elbow of your non-shooting arm will be on your knee, either be on top of or on the inner portion of the leg that is forward. Use the position that will stabilize your shoulder best and ensure you have a steady arm for firing. For this exercise, use an 8 lb body bar (or training M 16) to simulate the M 16. Hold the bar as if you were firing. The goal of this exercise is to hold the bar as steady as possible for timed segments. Start off with 10 second increments and build up to 60 second increments.

Kneeling Unsupported

Simulated Kneeling Unsupported

Simulate Prone Unsupported Position: While lying on your stomach, take your non-firing arm and place your elbow on the ground. This arm will be used to stabilize or hold the weapon steady. Take your left leg and bend at the knee and hip so your knee is pointing out and at hip level. If you do not have the hip range of motion to perform this movement, you could also have both legs (in an extended or straight position) moved off to the side (would be to your left if your right arm is your shooting arm) so you are bending at the waist. For this exercise, use an 8 lb body bar (or training M 16) to simulate the M16. Hold the bar as if you were firing. The goal of this exercise is to hold the bar as steady as possible for timed segments. Start off with 10 second increments and build up to 60 second increments.

Prone Unsupported-Legs Straight

Simulated Prone Unsupported-Hip Flexion

Low Crawl: To begin, the PT leader should yell, "Go!" or "Down!" Upon this command, you drop to the ground as quickly as you can and assume the prone position with your head turned to one side and an ear pressed to the ground. You may move your head if necessary, but the ear must stay in contact with the ground at all other times. Never raise your head to look around. (The PT leader can also order the direction of the crawl -- to the front, rear, right or left -- if desired.) To perform the crawl, start by bringing a leg up along the side of your torso. Touch your elbow with your knee, or get as close as you can. Your opposite arm moves forward above your head, with the arm bent at 90 degrees. You then transfer your weight to the cocked leg and forward elbow and push yourself ahead until your forward arm comes in contact with your body and your legs are even and extended. Repeat with the other leg and arm. Continue for time or distance.

Low Ready Repetitions with Theraband or Body Bar: If you are right handed, perform an underhand grip with your left hand and an overhand grip with your right hand. Assume the low ready position by angling the left end of the bar towards the ground and lifting the right end of the bar up. This exercise could also be performed with a theraband by adjusting the length (by stepping on the tubing to produce the desired length) of this tubing to simulate the upper body actions during the low ready position. This exercise could be performed for 15-20 repetitions to build muscular endurance of the shoulders and biceps or could be used in an isometric hold to simulate the low ready hold during prolong marches.

Simulated Low Ready
Weighted Body Bar

Low Ready with Prolonged March: Simulate the low ready position with an 8 lb weighted bar or a training M 16. Maintain this position in an isometric hold (do not move elbow joints and maintain the same position) to prepare the upper body for prolong marches. Begin with a 2-3 minute hold increments, with 1-2 minute rest periods in between, and gradually build up to over 30 minutes of continuous isometric holds with marching activities (on a track or on a treadmill).

Low Ready with Prolonged March on Incline/Decline: Perform the low ready hold with a weighted bar on a treadmill to simulate going up/down hills in a prolonged march.

Weighted Vest with Exercise: To prepare the body for the weight of the Interceptor Body Armor, wear a weighted vest during various activities. Even though adding additional weight is not good for the joints during high impact activities (where the feet leave the ground), it is necessary to perform these activities to simulate some of the training evolutions you will encounter during combat training. The weight of the vest will also load the spine, which will also aid in providing stress to the body's skeletal system and assist in increasing bone mass of an individual if they are training properly.

Casualty Carry: This exercise will prepare the body for casualty carrying in the field. Remember that during combat training, with the added gear (60-70 pounds+) you and your battle buddies may be responsible for carrying members over 250 pounds to safety. To perform this exercise, you can use a weighted dummy (if your unit can purchase this) or you can use individuals within your training unit. If a member has a uniform available, have him/her put it one so you can utilize it during a casualty drag. If not, you can still practice lifting techniques and ensure proper body mechanics are used during this exercise drill. Listed below are some key points to performing a safe carry of a casualty:

1) Members lifting the casualty are bending at knees vs. bending at back

2) Members must position themselves as close as possible to the casualty in order to reduce the amount of stress they will add to their arms.

3) In order to get close to a body lying on the ground, members will perform a deep squat to position themselves close to the body.

4) They will then place one arm under the casualty's back (or hooking your hand with the other member's hand that is lifting the casualty from the other side) and the other arm under the leg.

5) Have both members perform a simultaneous upwards motion with from the deep squat position and lift the member up. Remember to stay close to the member so you do not put addition stress/strain on your body and the majority of lifting should come from your legs.

**If the member is too heavy, you may have to engage in the casualty drag to move the body. Other methods of moving the casualty may involve the "fireman's carry" as well.

Body Thrust Pull-Up Sequence: This exercise will be used to prepare you to perform quick transitions and will also incorporate several different functional activities into one complete repetition. You will first perform a body thrust and immediately jump up and grab the pull up bar and perform one repetition of a pull up. They will then release from the pull up bar and go to the standing position. This is the entire sequence of the exercise. Since a member may become dizzy transitioning from a push-up to standing position, this exercise needs to be performed slowly and for lower repetitions. This is an advanced exercise and should not be performed by beginners.

Agility Drills:

Zig-Zag Drill: In between two parallel lines or rows of cones 5-10 yards apart, you will sprint from side to side and touch markers on the ground in a zig-zag pattern while proceeding forward for 35-75 yards. You can add variety to this exercise by performing a backwards jog in a straight line from the end of the course to the start (perform the backwards on the right side of the course so it does not interfere with other members ability to complete this exercise).

T-Drill: You can perform this drill on a basketball court or on a field. Point one will be the starting position or at the 0 yard line. You will start this exercise by sprinting 25 yards forwards in a straight line towards point 2 at the 25 yards line. Once you hit point 2, you will then side shuffle/step 10 yards to the right, touch the ground (point 3) and then continue to shuffle back towards point 2 and proceed past it to point 4, which is 10 yards to the left of point 2. At point 4 you will touch the deck and side shuffle back to point 2. Once you hit point 2, you will then perform a backwards shuffle or jog to the starting point or point 1. This is a timed event and should be performed to test agility and you need to ensure good technique with the side step and backwards shuffle/jog. The markers on a basketball court will be:

Point 1=End of Basketball Court (Starting Point)
Point 2= Spiking Line of Volleyball Court-directly inline with Point 1
Point 3=Right Out of Bounds Mark for Volleyball Court
Point 4=Left Out of Bounds Mark for Volleyball Court

Side Stepping and Touch the Deck: In a defensive position (partial squat with feet shoulder width apart and hands at waist level), take 3 side steps to the right (make sure you maintain a partial squat and remain low) and touch the deck/ground by perform a deeper squat. You will then return to the defensive position and take 3 side step to the left and touch the deck/ground. This is one repetition. You can also replace the touch the deck/ground with the following exercise to target different muscle groups: step behind (or skaters step), standing side crunch (using elbow and knee on the same side-will be on the side of the body that you are not leading the side step with) or steam engine (using elbow on the leading side of your body and the opposite knee on the inside).

Suicides: You can perform this exercise on a basketball court or out in the field. Set up markers at the following distances: 0 yard line (start), 15 yards, 25 yards, 35 yard, and 50 yard. The member will sprint to the 15 yard mark and touch the ground and sprint back to start (0 yard mark); they will then proceed onto sprinting to the 25 yard mark, touch the ground and sprint back to start. The next sequence of the exercise would be to sprint to the 35 yard mark and back to start and then onto the 50 yard mark and back to the starting point. This is one entire sequence/repetition of this exercise and it should be performed for time/speed. On the basketball court, your markers will be:

Point 1=End of Basketball Court (Starting Point)
Point 2=Closest Foul Line
Point 3=Half Court
Point 4=Farthest Foul Line
Point 5=End of Basketball Court-Far End

Shuttle Runs: Shuttle runs will be ran at distances of 50-75 increments. You will sprint to the 50 or 75 yard mark, perform an exercise and sprint back. Some of the exercises that could be performed at the 50 or 75 yard mark are the following: push-ups, crunches, jumping jacks, etc. This exercise will be performed for time and to increase your speed. It is also a good way to incorporate team work and camaraderie during group physical training sessions.

Agility around Cones and Other Obstacles: Place 4-7 cones on a 50-75 yard course. The goal of this exercise is to utilize speed and agility to improve your ability to perform combat related activities during convoy and urban operations. This exercise will be performed for time and you will weave around the cones to the 50 or 75 yard mark and back to start in the least amount of time.

Obstacle Course: If an obstacle course is available, participate in this type of event so you can test your speed, agility, and functional ability to climb over walls and to perform activities such as a low crawl for a prolonged period of time. This will also simulate "real-life" scenarios you may encounter during deployments and drills you will participate in during combat training. If you do not have an obstacle course, here are some activities you may add to develop a course for yourself:

1) Segment where you utilize speed (sprints for 50-100 yards)
2) Obstacles you need to clear (wall or a platform you need to climb up on)
3) Low crawl segment (with or without wire and obstacles to crawl under)
4) Agility Segment (adding cones or items you need to weave around)
5) Casualty Carry (or use sand bags or tires you need to carry a certain distance)
6) Lifting Segment (where you need to lift weight to a higher platform)
7) Plyometric Segment (where you need to jump down from a platform)
8) Footwork Segment (tires, agility ladder, plyometric hurdles-you need to clear)
9) Line Pulling Segment (weight line where you drag item 25-35 yards)
10) Push Up Segment (incorporate pushing activity while body is fatigues)
11) Pull Up Segment (simulates pulling body over wall)

Footwork and Plyometrics:

High Knees: In a linear forward motion, you will perform 25-50 yard intervals of "high knees". During this exercise, the opposite arm will advance forward as the knee comes up to approximately hip level. Your range of motion of your hip will improve as your muscles warm up and you will be able to achieve more hip flexion. This exercise should focus on form, not speed. You can also add variety to this exercise by performing the "high knees" with the knees pointing slightly outward. In addition to using the hip flexors, this "outward knee" motion will also utilize the hip external rotator muscle groups.

Kick Butt: This exercise is performed in a linear forward motion for 25-50 yard intervals. You are going to advance forward with an exaggerated "knee flexion" movement where you try to contact your buttock with the heel of the same leg. This exercise will emphasize use of the hamstring muscle group and should be performed in a slow motion, focusing on form.

Carrioka: This exercise will test your agility, footwork and coordination. You will start off by facing sideways in a defensive position (feet shoulder width apart and a slight bend in the knees) with the right hip facing the front-in the direction you will be moving towards. You will then progress in a lateral movement by crossing the left foot in front of the right, and then side step with the right foot so your feet are shoulder width apart again. You will then take the left foot and cross it behind the right and side step with the right until your feet are shoulder width apart again. This is one sequence. Repeat this sequence for a certain distance (ex: 50 yards).

Broad Jump: This exercise is a beginner level plyometric exercise, or explosive movement to increase the power and strength of the lower body. You will perform multiple broad jumps in a linear forward motion by having jumping forward with both feet together. The goal is to jump as far forward as possible (without compromising form) but ensuring you land with "soft feet", or a slight bend in the knees and on your toes. This will reduce the impact/shock on the body as you land. You should also use an exaggerated arm swing (both arms swing together at same time) to help give you momentum when you advance forward.

Broad Jump over Plyometric Hurdles: This exercise is performed using the same form as the broad jump but will also have to clear a 6-12" hurdle by increasing your vertical distance from the ground with each jump. Plyometrics hurdles can be found at your local MWR facility or you can replace them with stick balanced on two blocks.

Lateral Line Jumping: This exercise will introduce your body to lateral movement and will also increase the strength of the tendons around the ankle joint, therefore reducing the incident of lateral ankle sprains. With both feet together, you will hop from side to side over a line for a certain amount of time (ex: 1-2 minutes). To make this exercise more difficult, you could progress to performing this exercise with one leg or using a hurdle. By adding the hurdle, you also have to focus on clearing the obstacle and increasing the vertical component of the lateral motion.

Box Drill for Speed: This exercise is performed by taping an 18-24" box on the floor. You will start this exercise with both feet in the center of the box. You will then jump with both feet together outside of the box to the top of it and will then jump backwards with both feet to the middle of the box, where you started this exercise. The next step would be to jump to the right side of the box, outside of the taped area and back into the center. You will then jump outside of the box, backwards to the bottom and then back to the center once more. The last step of this sequence would be to jump outside of the box to the left side and back to the center. This is one entire sequence. Once you are comfortable with the sequence and order of hops, you will then complete this entire sequence (go clockwise around the box) for speed and a specific time (1-2 minutes).

Box Drill Increasing Vertical to Clear Obstacle: You will start this exercise with both feet together and will jump up onto the box and land with both feet together and a moderate bend in the knees. You will also need to use a double arm swing to gain momentum for the vertical motion. If this is the first time you are performing this exercise, start off with the 6" box and gradually increase the height.

Box Drill-Jumping Off-Simulate Humvee: One of the activities you will have to perform during combat training is getting onto and off of the humvee. With the extra weight from the IBA and rest of the gear, it will make it more difficult to perform this action while maintaining your balance. You also need to remember to land on the ground with "soft knees" or a slight bend in them to reduce the shock to the body when you perform jumping activities.

You will simulate this activity by standing onto a box 24"-48" in height. Beginners should begin with the 24" height until they get their form perfected. With a weight vest and a body bar to simulate holding a M 16 in a low ready position, you will initiate the jump with your feet at shoulder width interval and a slight bend in their knees. You will then slightly lean forward and jump off the platform and lands with "soft feet" on your toes and with a slight bend in their knees. When they you land, you need to assume the low ready position. If you want to make this exercise more difficult, perform an explosive motion after the jump such as taking a quick turn and 25 yard sprint towards the enemy.

Start Position

End Position

Jack Plyometric: This exercise will be used to introduce your body to an explosive motion in the vertical direction. The member will perform 3 jacks and will then do a simultaneous knee tuck by jumping up and bringing both knees to the chest and gently land back on the ground with both feet. To reduce impact on the knees member should land on their toes with a bend in both knees.

Side Twist Plyometric: This exercise will introduce your torso to a rotational motion while you are performing a plyometric exercise. You will begin this exercise in the defensive position (feet slightly wider than shoulder width apart while performing a partial squat and having both hands at hip level and palms facing outward). You will then jump up in the air and will rotate the lower body to the left while the upper body rotates to the right. You will then land back on the ground in this position while maintaining a slight bend in the knees and hands at the hip level with palms facing forward. You will then jump up in the air and perform the opposite motion: the lower body will rotate to the right while the upper body rotates to the left. This is one repetition. Repeat this exercise by going back and forth for a certain period of time (ex: 2-3 minutes).

Medicine Ball Toss Plyometric: This exercise will prepare your upper body for explosive pushing and throwing movements. Two individuals will participate in this event and will stand 5-10 yards apart. You can use medicine balls or sand bags of varying weight, depending on the intensity level you want to engage in. The goal of this exercise is to catch the ball and perform a strong pass in the shortest amount of time without compromising technique. This exercise will be performed for a certain time period depending upon the individuals exercise level. Beginners should start at 30 seconds while an advanced individual can perform this for several minutes 3+ with an increase in weight for the medicine ball or sand bag.

Balance:

Knee Blocks: This exercise will be used to introduce the body to uniped (one leg) balance exercises and will also strengthen up the hip flexor and abdominal musculature. You will start the exercise by placing both arms (with elbows straight) overhead and by your ears. You will then bring both arms downward while your right leg performs hip flexion (with your knee bent) until the hands meet the knee at approximately hip level. To engage the abdominal and core musculature, contract your abs while performing the knee block. This exercise could be performed for 15-20 repetitions x 3 sets for each leg or by performing an alternating leg sequence for a total of 15-20 repetitions for each set.

Start Position

End Position

Resistance Tubing Balance Exercise: You will use this exercise to improve your balance on one leg when you have outside forces or resistance acting against you. You will take a piece of resistance tubing and tie it around one ankle. The other end of the band/tubing will be tied to a pole. While standing on the opposite leg (the one without the tubing) to practice balance put a slight bend in that knee so it is not locked out. You will use your leg with the tubing will be performing hip motions (with leg straight) in all 4 directions (forward, backwards, across the leg to midline of body, and out away from the body) to throw off the balance of the opposite leg. It is easiest if you perform 15-20 repetitions in each direction and proceed onto the next. Perform these balance exercise for a total of 3-5 minutes and switch legs. If you do not have tubing/bands, you can also perform this activity by performing the hip motion alone on the non-balancing leg. This will not be as difficult, but it will also throw off your center of gravity and improve your balance.

Ball Toss on One Leg (Uniped): This exercise is an intermediate level balance activity. You will stand on one leg and take a ball and bounce it off of a wall and catch it. The goal is to bounce the ball and catch it away from your body to throw off your center of gravity, therefore increasing the difficulty of this balance exercise. Perform this exercise for 3-5 minutes.

Ball Toss on Uneven Surface (Sand Bag or Pillow): You will perform this exercise by standing on an uneven surface (sand bag or pillow) to make the tendons in your arch and around your ankle work harder to maintain the balance. The ball toss sequence is performed as explained in the above exercise. This is an advanced level balance exercise.

Walking Lunge with a Kick: This exercise incorporates balance, flexibility and lower extremity strength. You should not perform this exercise if you do not have good form with a basic walking lunge. Start this exercise by placing one foot in front of the other, far enough to go down into a lunge position (both knees at approximately 90 degree bend and the front knee is above the ankle joint). You will then take the back leg and bring it forward into a "forward kick" (as in cardio kickboxing) while maintaining balance. The leg that just kicked will then be placed on the ground and you will go directly into another lunge. This is one entire sequence. Perform this exercise for 20-40 yard increments or down the basketball court. It is important you maintain good form during all movements in order to prevent injury to the body.

Position #1

Position #2

Position #3

Position #4

BOSU Balance Activities: A BOSU (Both Sides Utilized) is a piece of exercise equipment that is composed of half of an exercise ball on top of a flat plastic disk surface. This tool is used to improve core stability and to enhance a member's balance. A member can use this piece of equipment in the following way:

1) Standing balance activities using both legs on curved side-beginners level
2) Standing balance activities using one leg on curved side-intermediate level
3) Perform one leg ball toss on the curved side-advanced level technique
4) Perform a squat on curved side-intermediate level technique
5) Perform a squat on flat side-advanced level technique
6) Perform a lunge with front foot on curved side-intermediate level technique

Exercise Programs

Each person will be at a different fitness level when beginning this combat training program so a standardized program is not going to address your individual needs but will get you started in the right direction. It will provide you some guidance on general exercise progression but you should rely on your body's response and your local fitness experts to individualize a program specifically for you. Since it takes at least 6-8 weeks to notice any significant gains in cardiovascular endurance and strength, you should begin your Pre-IA Training at least 8 weeks prior to reporting to official duty. Not only will you be focusing on the fitness areas mentioned above, but you will also work on improving your balance, agility, and overall stamina.

This combat training program will utilize exercises your body is not accustomed to and may be at a higher intensity level than you normally work out at. Therefore, it is pertinent that you don't over train and you are medically cleared prior to engaging in these activities.

All workout sessions will start off with a 10 minute dynamic warm-up in order to prepare your muscles and cardiovascular system for the upcoming training. You will then choose the activities suited for your fitness level designated for that day. For instance, if you are scheduled to perform functional exercises and you are just beginning this program, you may want to start off with an easier exercise such as a chest press versus performing a body thrust pull up. After you have completed the main activity, you will then proceed onto a 5 minute cool down to gradually decrease your heart rate to its pre-activity level. You will finish your training program with stretches to promote overall body flexibility and to ensure you have the range of motion needed to perform these exercises in future training evolutions. Since your muscles are already warmed up, this is the recommended time to perform the static stretches. Do not neglect this part of the program or it may affect your performance and also lead to muscle imbalances and injury. You will be provided with some sample dynamic warm-up/cool-down exercises and flexibility exercises at the end of this manual.

SAMPLE 10 WEEK TRAINING PROGRAM

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	Functional Training Exercises 1 Mile Simulated Road March in Low Ready	Injury Prevention Exercises Core Stabilization Exercises	Upper Body Strength Shoulder Stabilization 2 Mile Run	Injury Prevention Exercises Core Stabilization Exercises	Foot Work, Agility & Balance Activities Lower Body Strength	Injury Prevention Exercises Core Stabilization Exercises
2	Speed Training Session Upper Body Strength Shoulder Stabilization	Injury Prevention Exercises Core Stabilization Exercises	Functional Training Exercises 1.5 Mile Simulated Road March in Low Ready Position & Weighted Vest	Injury Prevention Exercises Core Stabilization Exercises	Plyometrics Lower Body Strength 30 Minute High Intensity Cardiovascular Training	Injury Prevention Exercises Core Stabilization Exercises
3	Plyometrics Functional Training Exercises 2 Mile Simulated Road March in Low Ready on an Incline	Injury Prevention Exercises Core Stabilization Exercises	Footwork, Agility & Balance Activities Upper Body & Shoulder Stabilization Exercises 2 Mile Simulated Road March at a Faster Pace with Weighted Vest	Injury Prevention Exercises Core Stabilization Exercises	Speed Training Session Lower Body Strength Exercise Shoulder Stabilization Exercises	Injury Prevention Exercises Core Stabilization Exercises
4	Footwork, Agility and Balance Endurance Workout 3-5 mile jog	Injury Prevention Exercises Core Stabilization Exercises	Functional Training Exercises 3 Mile Simulated Road March in Low Ready Position with Weighted Vest	Injury Prevention Exercises Core Stabilization Exercises	Plyometrics Speed Training Upper Body Strength and Shoulder Stabilization Lower Body Strength	Injury Prevention Exercises Core Stabilization Exercises

5	Functional Training Exercises 3 Mile Simulated Road March in Low Ready Position on Incline and Weighted Vest	Injury Prevention Exercises Core Stabilization Exercises	Upper Body Strength Shoulder Stabilization Lower Body Strength 30 Minute High Intensity Training on Cardio Equipment	Injury Prevention Exercises Core Stabilization Exercises	Foot Work, Agility and Balance Functional Training Exercises for Speed	Injury Prevention Exercises Core Stabilization Exercises
6	Speed Workout Upper Body Strength Lower Body Strength	Injury Prevention Core Stabilization	Shoulder Stabilization Exercises Plyometrics Endurance March: 4 Mile Road March in Low Ready Position	Injury Prevention Exercises Core Stabilization Exercises	Balance Activities Functional Training Exercises Lower Body Strength Upper Body Strength	Injury Prevention Exercises Core Stabilization Exercises
7	Functional Training Exercises for Speed Shoulder Stabilization Exercises	Injury Prevention Exercises Core Stabilization Exercises	Lower Body Strength Upper Body Strength 5 Mile Jog for Endurance	Injury Prevention Exercises Core Stabilization Exercises	Speed Training, Agility, Foot Work 2 Mile Simulated Road March on Incline	Injury Prevention Exercises Core Stabilization Exercises
8	Balance, Agility and Foot Work Upper Body Strength Shoulder Stabilization Exercises 20 minute High Intensity Training on Cardio Equipment	Injury Prevention Exercises Core Stabilization Exercises	Functional Training Exercises Lower Body Strength	Injury Prevention Exercises Core Stabilization Exercises	Upper Body Strength Shoulder Stabilization Exercises Endurance Jog: 4-5 miles	Injury Prevention Exercises Core Stabilization Exercises

9	Balance Plyometrics Functional Training Exercises for Speed	Injury Prevention Exercises Core Stabilization Exercises	Upper Body Strength Shoulder Stabilization 5 Mile Simulated Road March in Low Ready Position	Injury Prevention Exercises Core Stabilization Exercises	Footwork, Agility Lower Body Strength 3-4 Mile Simulated Road March in Low Ready Position	Injury Prevention Exercises Core Stabilization Exercises
10	Functional Training Exercises 3 Mile Simulated Road March in Low Ready Position on Incline	Injury Prevention Core Stabilization Exercises	Plyometrics Speed Training Upper Body Strength Shoulder Stabilization	Injury Prevention Exercises Core Stabilization Exercises	Balance Exercises Functional Training Exercises 4 Mile Simulated Road March in Low Ready Position on Incline	Injury Prevention Exercises Core Stabilization Exercises

ADDITIONAL RESOURCES

Warm-Up, Cool-Down, and Stretching

The most important goal when preparing to exercise should be to increase the body temperature and to prepare the muscles, connective tissue, and circulatory system to safely accommodate more intense exercise. For this reason, all exercise routines should begin with warm-up exercises and then proceed onto the planned activity. In the past, most exercise routines began with a general stretch routine. Current exercise guidelines recommend that the best time to stretch is after cardiovascular exercise or a muscular workout when the body temperature is elevated. Your exercise program should consist of the following activities, and should be performed in the following sequence:

1) Warm-up routine
2) Pre-planned activity (cardiovascular, strength, or agility activity)
3) Cool-down routine
4) Stretching

Principles behind the "Basic Warm-Up"

The warm-up should be designed to raise local and core temperature and to increase blood flow to the working muscles. Because of this increase in temperature and blood saturation, a proper warm-up improves performance and reduces injury. Improved blood flow is necessary so that enough oxygen and nutrients are carried to the cells and so that the additional waste products produced can be adequately removed. In the muscle, the mechanical efficiency of contraction is enhanced and the contraction itself is quicker and more forceful. These physiologic principles make a strong case for not omitting dynamic warm-up prior to your exercise activity. This is especially important when exercise is performed in a cool or cold environment. Extremely cold surroundings may require an additional 5 to 10 minutes added to the general warm-up routine.

Warm-up should start with low impact aerobics (where at least 1 foot remains on the ground at all times) and gradually increase in intensity. In addition to these guidelines, the activities performed in the warm-up routine should mimic the activities you will be participating in. For example, if you are going to run, you should perform a warm-up consisting of standing hip flexion with a simultaneous arm swing, and then proceed onto jogging in place.

Remember that no stretching should be included during this segment. The circulatory warm-up should continue until a light perspiration is present. At this point you should not feel tired or out of breath. Your heart rate and respiration rate are slightly elevated, your muscles are warmer and you are ready to proceed to the next portion of your workout. Your dynamic warm-up should last for 5-10 minutes in duration.

Warm-Up Exercises:

Select the exercises that will use the muscle groups and actions that you will use during your pre-planned physical activity. These exercises should be performed for 5 - 10 minutes and the intensity level should increase as the routine progresses. Start off with low-impact activities (1 foot remains on ground at all times) to avoid injury and gradually increase the difficulty to higher-impact activities.

Low Impact Warm-Up:

1. **Speed Bag:** With your fists clinched, raise your elbows to shoulder level and simulate you are punching a speed bag by rotating your fists around one another. After performing this exercise at shoulder level, gradually move the exercise to above your head. Once your lower body is warmed up, you could also increase the intensity by performing a boxer's shuffle with your feet.

2. **Pec Fly with Overhead Raise:** With elbows bent to 90 degrees, raise your elbows to shoulder level and move them back so they are in alignment with your body (arms should look like a field goal post). This is your starting position. Bring your elbows together as if you were performing a pec fly. Once your elbows/fist are touching (midline body), gently lift both arms up and over your head. Reverse this exercise to get back to starting position.

3. **Chest Press/Shoulder Press Combo:** Simulate you are performing a push-up in the air in front of your body. Once you get back to the starting position, then proceed into an overhead should press. Make sure you use a narrow hand-stance and keep elbows tucked in during the shoulder press to ensure you are engaging the tricep (back arm) muscle.

4. **Bob and Weave (Jab):** Place your feet slightly wider than shoulder width apart. Go into a partial squat and guard your face by placing your fists in front of it. Start bobbing from side to side and simulate you are avoiding punches from an opponent. Once you are warmed up, you can start to throw jabs from side to side to engage the upper body into a warm-up.

5. **Calf Raise with Simultaneous Neck Rotation:** Perform a standing calf raise and rotate your head to look over your right shoulder. Perform 10 repetitions to the right and switch it up and perform 10 to the left (by looking over your left shoulder).

6. **Steam Engines (Standing Oblique):** In a stance with your feet shoulder width apart, perform an oblique exercise by bring your right elbow to your left knee (performing hip flexion with knee bent on left leg). Make sure you are contracting your abs during this exercise. DO NOT pull on your neck. Repeat to other side.

7. **Standing Side Crunch:** Standing with feet shoulder width apart, with knee bent, externally rotate left hip so it knee is pointing towards outside body. With left elbow bent and hand placed behind neck, lift knee towards elbow to perform a side crunch. Repeat for a certain number of repetitions and repeat on other side.

Moderate Intensity Warm-Up for Lower Body:

1. **Knee Blocks/Alternating Knee Blocks:** With both arms raised above your head, contract your abs and lower both arms to your right knee to perform a knee block. Perform a certain number of repetitions. Repeat on left side. Perform alternating knee block by alternating from right to left side after one repetition.

2. **Squat with Front Shoulder Raise:** Stand with feet slight wider than shoulder width apart. While performing a squat, lift both arms up to shoulder level just like you are performing a front raise with dumbbells. Return to starting position. To make this exercise more difficult, perform a 3 count down and a one count up. The 3 count down will also be slower and will allow the members to focus on good technique (knees remains above the ankle and all movement will be performed at the hips/buttock lowering down).

3. **Reverse Lunge with Lateral Shoulder Raise:** Stand with both feet at shoulder width apart. Take your right leg and step back into a lunge ensuring your left knee remains above your left ankle and you maintain a 90 degree bend in both knees. While you are performing the reverse lunge, perform a simultaneous lateral deltoid raise to shoulder level (elbows are bent). Your arms should move in the same plane as your body and should not go above shoulder level.

4. **Multi-directional Lunge:** You are going to perform the basic lunge in multiple directions in order to target different muscle groups in the lower body. The directions of the lunges will be given by the appropriate number on the face of a clock. Start this exercise with both feet together and facing 12 o'clock. Start the first sequence with your right leg. Perform lunges in the following order: 1) front lunge-12 o'clock 2) Front Diagonal Lunge-2 o'clock 3) Side Lunge-3 o'clock 4) Back Diagonal Lunge-5 o'clock (member will pivot on left foot and face backwards and do a lunge towards 5 o'clock). Then return to starting position. This entire sequence is one repetition. Complete exercise for a certain amount of repetitions, and proceed to the left leg.

5. **Squat with a Kick:** With your arms in a guarded position, perform a squat and then perform a left front kick, perform another squat, and then perform a right front kick. This will also help prepare the member for balance activity.

Cardio Boxing Warm-Up:

1. **Jump Rope:** Simulate jumping rope to prepare the body for high impact activity. This should NOT be one of your first warm-up exercises. Vary this exercise by using the following techniques: double jump, single foot, and alternating feet/shuffle.

2. **Straight Jab:** Standing with the right hip forward and both fists in front of your face in a guarded position, take your right hand and do a quick jab towards the front. Return to starting position. You can add a boxer's shuffle to this activity to increase the intensity.

3. **Straight Jab-Side Jab:** With your right hip facing forward, take your right fist and jab once to the front. Then you will pivot on your left foot and move the jab to the side. Pivot again on your back foot to return to the starting position. Repeat sequence.

4. **Alternating Hooks:** With your feet slightly wider than shoulder width apart and your hands in a guarded position, begin tapping your feet from side to side. Once you got the rhythm, start to throw a right hook when you tap the right foot and a left hook when you tap the left foot. Remember to do a slight pivot with the back foot (the one on the same side you are throwing a hook) to ensure you do not strain the knee. A hook is performed by starting with your arms in a guarded position. With your right arm (keeping your elbow bent), bring your elbow back and rotate your shoulder so you bring your fist back to midline of your body with your forearm at shoulder level and parallel to the deck.

5. **Upper Cuts:** With your feet slightly wider than shoulder width apart and your hands in a guarded position, begin tapping your feet from side to side. Once you got the rhythm, start to throw a right upper cut when you tap the right foot and a left upper cut when you tap your left foot. Remember to tap your back foot. An uppercut is performed by keeping your elbow bent and moving your punch from hip level to in front of your face. Remember to use your legs (by going up) to add power to this move.

Sport Specific Warm-Up:

1. **Quick Feet/High Knees (Foot Ball Player Shuffle):** Have members start this exercise in a defensive position where they are in a partial squat, feet slightly wider than shoulder width apart and hands at waist level. Member will perform a quick shuffle of feet until the instructor calls high knees (where the member performs running in place). To ensure proper warm-up, do not have members have high knees at maximal position for the first sequence and gradually increase the height of the knees and tempo of exercise. To increase the difficulty of this exercise, have members challenge their cardiovascular fitness by counting down from 10 in the high knee position.

2. **Three Side Steps and Touch the Deck (Lateral Movement):** In the defensive position, have members take 3 side steps to the right (make sure they maintain a partial squat and remain low) and touch the deck. They will then return to the defensive position and take 3 side step to the left and touch the deck. This is one repetition. You can also replace the touch the deck with the following exercise to target different muscle groups: step behind, standing side crunch or steam engine.

3. **Plyo-Jack:** This exercise will prepare your body for upcoming jumping activities, especially plyometrics. Perform 3 jumping jacks and then proceed onto doing a double knee jump tuck where you will jump as high as you can with the overall goal of your knees coming up to chest level. Remember to land with "soft knees" and on your toes so you reduce the impact on your joints.

4. **Jack-Jab:** Perform a jumping jack, then a right jab, then another jumping jack and a left jab. By adding the jab, you will add more upper body and increase the intensity of this exercise more than do a normal jack. Make sure pivot on the back foot when performing the jab so you do not put additional strain on the knee.

5. **Cross Country Skiing:** To perform this exercise, simulate you are cross country skiing by alternating your left arm with right leg (simultaneous movement) and right arm with left leg. Repeat for certain number or repetitions.

Warm-Up for Running:

In order to avoid injury, you should not start off a running activity at full intensity. Especially with speed training or sprint routine you should add an additional 5 minutes of dynamic warm-ups. Also, your sprints should start off at a 50 to 60% maximal effort level and gradual increase the intensity with each sprint series until you achieve 100% maximal effort.

Running Activity or Aerobic Activity

Cool-Down

The cool-down will be performed after the planned physical activity and its purpose is to gradually lower the heart rate and respiratory rate to pre-activity levels. Most cool-down regimens will consist of 5 to 10 minutes of exercises, decreasing in intensity as the routine progresses.

Selected Cool-Down Activities:

You can use the same activities you used for the dynamic warm-up session but you will perform the activities in reverse order: starting from the higher-intensity exercises and proceeding to the lower-intensity exercises. This will gradually lower your heart rate and prepare your body for the flexibility portion of the exercise program.
**Please note that an individual's balance and technique may be altered due to muscle fatigue and may not be able to perform higher-level activities for an extended time (ex: high-knee exercises for 30 seconds+.)

Final Stretch

The final stretch is the last segment of your workout and should consist of 5 to 10 minutes of flexibility exercises. Since your muscles and connective tissue are completely warm, it is okay to stretch using more tension than you normally would. Always release slowly from the stretched position. In addition to increasing or maintaining flexibility, this last segment serves as a final cool-down from the aerobic and muscular conditioning exercises.

Benefits of a Proper Stretching Program

- Improved posture and body symmetry
- Increased range of motion for each joint
- Minimize low back pain and other joint pain
- Minimize soreness
- Promote relaxation and reduce anxiety

Types of Stretching

There are three basic types of stretching.

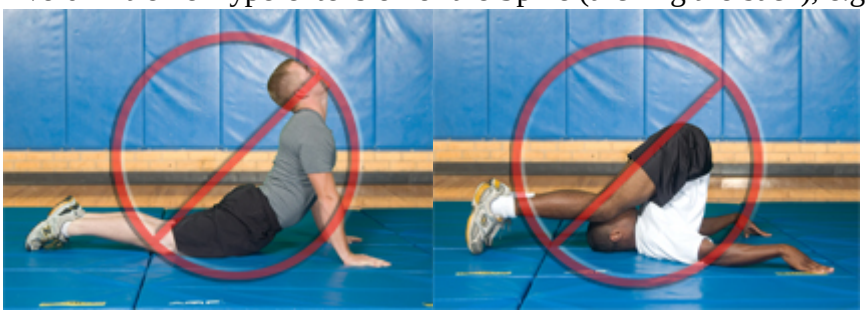
1) **Ballistic Stretching** consists of quick, repetitive, bouncing type movements. The momentum can result in damage to muscle and connective tissue and is not an effective method to increase flexibility.
2) **Static Stretching** involves gradually going into a position of stretch until tension is felt. Since static stretching is more controlled, there is less chance of exceeding the limits of the tissue thereby creating injury.
3) **Contract and Relax** (or PNF) involves contraction of muscles or muscle groups for 5 to 10 seconds followed by relaxing and stretching. Traditionally, this procedure has been utilized by therapists for rehabilitation purposes. If carefully instructed and supervised, contract/relax methods can be effective in flexibility programs. Some of the positions require a partner, however, which increases the risk of overstretching and consequent injury.

General Rules for Stretching Safety:

Stretching to increase flexibility is an important part of an overall fitness program and should not be excluded from your weekly regimen. Using static stretching the position should be held for 30 seconds to get maximal flexibility results. If your time is limited, try to perform stretches that involve several muscle groups at once (like those listed below), but make sure you do not compromise technique.

Things to Avoid While Stretching:

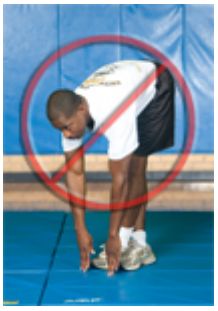
1) Avoid Extreme Hyperextension of the Spine (arching the back), e.g.



2) Avoid Locking any Joint and Always Keep a Slight Bend in the Knee when Performing Standing Stretches.

3) Never Force a Movement

4) Avoid Forward Flexion of the Spine, e.g.



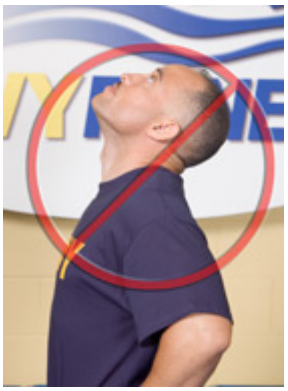
5) Avoid spinal rotations, they are bad for the back, e.g.

6) Do not perform circular motions, e.g.

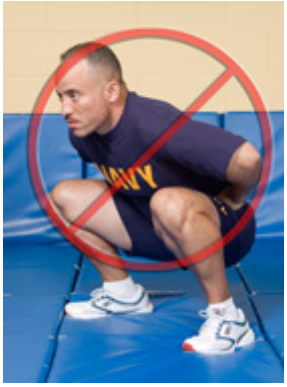
Contraindicated Stretches

It is best to completely avoid *contraindicated* positions or stretches. Although it is not guaranteed that an injury will result, the chances are much increased. There are safe and effective alternatives to contraindicated stretches. Even if you do not feel pain while performing a contraindicated stretch, damage may be occurring which will show up later.

Common contraindicated stretches



This stretch may cause an individual to get dizzy (extreme hyperextension)



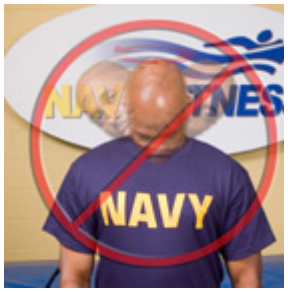
Deep squats put too much pressure on the knees

By the member leaning forward, he is putting too much stress on the low back.

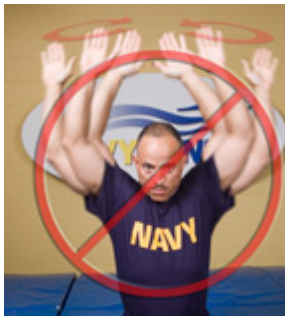
Hurdlers Stretch places too much stress on the left knee

This stretch puts too much stress on the knees and ligaments

Knee not above ankle-it is too far out



Avoid circles on the neck

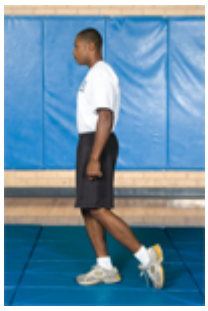


Arm circles may cause irritation to the tendons and other structures in the shoulder.

Navy Selected Exercises: Top 12 Stretches:

In order to perform an effective exercise routine, time management, and exercise selection will play a major role in your success. Several of these exercises involve stretching multiple muscle groups at one time so you can complete a total body flexibility program within 5 to 10 minutes. Also, the exercises selected should be performed in the sequence provided so you gradually transition from a standing position to a ground position. All stretches should be held for a minimum of 15 seconds.

Stretch #1: Neck Stretch with Simultaneous Shin Stretch



Description: In a standing position, gently grab your right arm and pull down so you get a little distraction (tension on the arm). Slowly look down and place your chin on the left side of your chest so you feel a stretch on the right side of your neck (trapezius muscle). At the same time you are doing this stretch, place your left leg behind you and drag your foot with your toes pointed. You should feel a stretch on the front part of your lower leg and at the top of your foot. If you have poor balance, do not add the shin stretch to this exercise. Repeat this stretch to the opposite side.

Forward Neck Stretch:

Description: Gently lower your chin to your chest until you feel tension in the back of your neck.
Caution: Do not perform neck circles.

Stretch #2: Chest Stretch

Description: In a standing position, gently clasp both of your hands and place them on the back of your neck. Slowly pull your elbows back until you feel a stretch on your chest. Do not pull your head forward or place tension on the neck
Caution: You can do this as a partner assisted stretch but they should not force the stretch by aggressively pulling back on the elbows.

Stretch #3: Hip Flexor Stretch with Simultaneous Posterior Shoulder Stretch

Description: In a standing position, place your left foot approximately 3 to 4 feet in front of your right foot (like a lunge). Slowly bend both knees until you lower your body towards the ground. Your right knee should almost be at 90 degrees. Gently push your right hip forward to feel the stretch in the front of your hip. If you don't feel the stretch, gently lean your upper body back. At the same time you are performing this hip flexor stretch, place your left hand on the back side of your right arm above your elbow on the front of your body and gently pull your arm across your body. You should feel a stretch on back side of your shoulder and upper arm. Repeat to stretch opposite side of your body.

Tip: Since you use this muscle group during the Navy Curl-Up, this stretch should be performed after the curl-up event to prevent cramping and prepare this muscle group for the cardio event.

Stretch #4: Quadriceps Stretch (Upper leg)

Standing Description: In a standing position, with a slight bend in your left knee, grab your right ankle with your right hand and maintain your balance. Gently pull your right foot towards your buttocks while making sure your knees is aligned with the body (make sure knee is not sticking out and it is directly below your hip). You can also stretch out your trapezius (neck) muscles during this quadriceps stretch (neck muscles) by bringing your chin to the opposite side of your chest.
Repeat to opposite side.

Additional Notes: If you are having difficulty balancing you can hold on to a wall or perform this stretch while lying on your side.

On-the-Ground Description: While lying on your side, with a slight bend in your left knee, grab your right ankle with your right hand and maintain your balance. Gently pull your right foot towards your buttocks while making sure your knees is aligned with the body (make sure knee is not sticking out and it is directly below your hip. Repeat to opposite side. **You can also stretch out your trapezius (neck) muscles during this quadriceps stretch (neck muscles) by bringing your chin to the opposite side of your chest.

Stretch #5: Calf and Achilles Stretch

Calf stretch

Achilles stretch (knee bent)

Description: In a push-up position, cross the left foot over the right. With the right knee straight, gently push the right heel toward the deck. You will feel a stretch in the right calf. Hold for 15 seconds. Slowly put a slight bend in your right knee until you feel the stretch move towards your ankle (Achilles tendon). Hold for 15 seconds. Repeat to opposite side.

Note: Your body should remain in a straight line from your shoulders to your ankle to prevent low back injury and to strengthen your core muscles.

Stretch #6: Abdominal Stretch

Contraindicated

Proper - Basic

Proper - Advanced

Description: On your stomach, place your hands beneath your shoulder and gently push up until you feel a stretch on your abdominal muscles. Do not fully lock out your elbows and hyperextend your back.

Note: If you feel any discomfort in your low back while performing this exercise, you can reduce the tension by using the “propped on elbow” position.

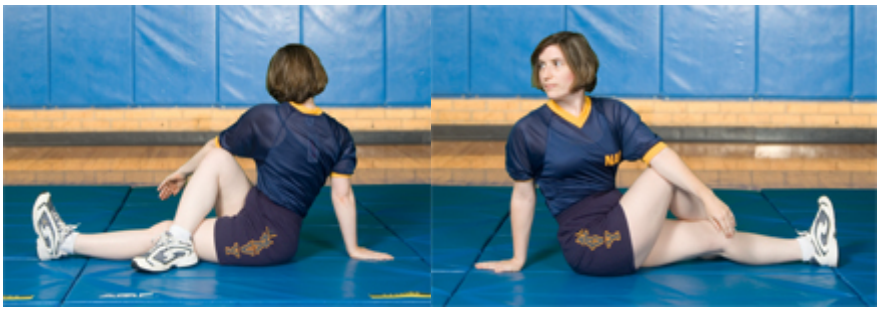
Stretch #7: Low Back Stretch

Description: While lying on your back, gently pull one or both knees to your chest. You should feel a stretch in your low back and buttocks.

Stretch #8: Piriformis Stretch

Description: While you are lying on your back, gently cross your right leg over your left thigh (both knees are bent at 90 degrees). Take both hands and place on the back side of your left thigh. Gently pull towards your chest until your feel slight tension in your right buttock and outer thigh. Repeat on opposite side.
Note: If you are experiencing low back pain after performing physical activity, seek medical assistance. This exercise should be performed to increase flexibility in this region and may assist in decreasing pain.

Stretch #9: Outer Hip and Low Back Stretch



Description: While in a long sitting position (legs in front of you with knees straight), cross your right leg over the left. Your right foot should be on the ground at approximately your left knee level. Take your left elbow and place it on the outside of your right knee and gently push your knee towards the left side of your body. You should feel a stretch on the outer portion of your right hip and in your low and mid back region. Repeat to opposite side.

Stretch #10: Hamstring Stretch

Description: While sitting in a v-position, gently pull your left foot towards your groin area. Your right leg will remain straight with a slight bend in the knee. Gently lean forward and reach for your toes on your right leg to stretch out your hamstring.
Note: The stretch will be more difficult if you try to perform the hamstring stretch if you pull your toes back towards your body (vs. pointed).

Stretch #11: Groin or Butterfly Stretch

Description: While sitting with the upper body nearly vertical and legs straight, bend both knees, and bring the soles of the feet together. Pull feet toward your body. Gently place your hands on your feet and your elbows on your knees. Pull your upper body slightly forward as your elbows push down. You should feel a stretch in your groin area.

Stretch #12: Plantar Fasciitis (Bottom of Foot) and Triceps Stretch (Upper Back Side of Arm)

Description: In a stooping position, sit on your right foot (with a bend in the foot) while your left leg is in front of you to maintain your balance. Gently use your body weight (by applying pressure to the heel of your right foot) to increase tension on the tissues on the bottom of your foot. While doing this stretch, take your left arm and reach behind your back. By placing your right hand on the back side of your left arm, gently push back to achieve a stretch on the left triceps muscle. Repeat on opposite side.