RAW PT, v.3.0

Further, Faster, Harder

Table of Contents:

A Brief History of RAW with an Introduction to v.3.0

MAY '08

The concept for the Ranger human performance initiative that eventually became "RAW" dates from the summer of 2005. At this time, the battalions had several years of experience with civilian strength and conditioning coaches. These coaches came from diverse backgrounds and this was reflected in their approach to training. Despite the fact those potential missions and the physical requirements of those missions are the same for each battalion, the instruction at the battalions varied significantly. Another more practical concern was also evident - even the most successful of the coaches could not practically serve the entire battalion. By way of comparison, a college football team might have four strength and conditioning coaches serving a much smaller element than a Ranger battalion.

As the concept for RAW emerged, three objectives were identified:

- **Control Injuries** - No one is against injury prevention measures unless they sacrifice performance. In nearly all instances, sound training practices control injuries and improve performance. For example, replacing some distance running with strength and/or movements skills training will not only decrease the likelihood of lower extremity stress injuries, but will also improve strength/movement skill performance.
- **Improve Performance** - The desire to improve performance does not suggest anything other than a fundamental philosophy of all great organizations– be better tomorrow than you are today. Fortunately, knowledge and experience allow us to train in ways that build upon the Ranger tradition of exceptional physical performance.
- **Standardize Ranger PT** - Rangers at each battalion should develop similar physical proficiencies. PT need not look exactly the same at each battalion, but physical capabilities should be more or less the same across the Regiment.

With those three objectives, the Regimental Medical Section began consulting military and civilian performance experts. In January of 2006, the RAW development team began a pilot study with a platoon from 3-75. Results were encouraging enough to present the full program to the battalions, beginning in June of 2006 with 2-75. The degree to which the program was implemented varied across the Regiment. Factors such as deficient space/equipment, op tempo, and leader preference for decentralized PT were cited as reason why RAW was not fully implemented. The RAW development team sought to address these issues with modifications to the initial program. Version 2.0 of the Ranger Athlete Warrior Program was introduced to the battalions beginning in January of '07.

Version 2.0 represented an attempt to align the program on paper with the reality on the ground. The major changes from the initial RAW guidance were:

- The use of menus to allow greater flexibility in planning workouts.

- More flexible scheduling guidance, with the option for battalions to follow the sample schedules provided or use general scheduling principles to create their own model.
- Squad-leader based execution of physical training on most days.
- Earlier use of battle-focused PT sessions.
- Addition of field-expedient strength training options.
- Changes to the Ground Base session to lessen time constraints.
- Availability of the RAW Handbook on Darby/CD. The handbook provides a visual reference to enhance execution of the drills.
- More running, with detailed guidance to avoid overuse injuries.

In January of 2008, the RAW team began training representatives from the battalions (one per company) to become subject matter experts (SMEs). The intent is for those SMEs, along with the BN physical therapists, to be the primary resources within the BN for RAW training, scheduling, and assessments. Also in January of 2008, senior leaders approved a battery of RAW athletic and tactical assessments. The assessments will be reviewed later in 2008, after the battalions have had a chance to execute and evaluate.

With **Version 3.0**, (the first formal training is scheduled for 1-75 in April 08), modification of the program continues based on feedback from across the Regiment and interaction with physical training professionals, both military and civilian. The major changes in RAW 3.0 are as follows:

- The addition of assessments that measure a broad range of physical attributes.
- Addition of power endurance workouts using the Tabata method.
- Updated guidance on the execution of all drills.
- Modification of scheduling guidance.

A major objective for v.3.0 and the training that accompany it is to clarify the intent of the program. RAW is not a series of training events that must be followed to the letter; it is a philosophy. A fundamental tenet of the program is that Rangers are athletes. To the degree that anyone depends on their physicality for occupational success, they are an athlete and must live accordingly. Such a life requires a smart, disciplined approach to 1) physical training, 2) nutrition, 3) mental toughness, and 4) prevention and management of injuries – the four components of RAW. Leaders are charged with guiding young Rangers down this path.

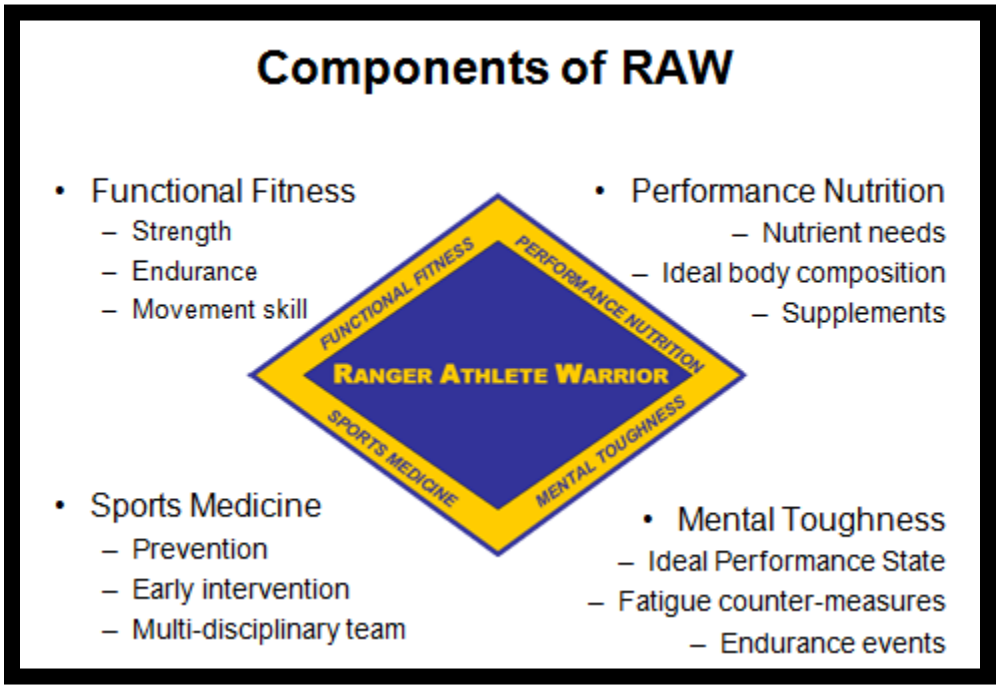
Clearly RAW is a work in progress. Leaders at all levels must take the fundamentally principles of the program and make it work for their men. As the saying goes, “the devil is in the details.” It is through your feedback that we will get the details right.

The battalion physical therapists and company-level RAW SMEs are available to provide guidance and receive your feedback. At Regiment, the POCs are LTC McMillian (R-PT/RAW OIC), MAJ Montz (R-Occupational Therapist), and CPT Barringer (R-Nutritionist).

The <u>PURPOSE OF RAW</u> is to provide education and training that optimize the physical/mental development and sustainment of the Regiment's most lethal weapon - the individual Ranger.

The <u>END-STATE OBJECTIVE OF RAW</u> is to field self-sustaining systems that ensure all Rangers:

- **Achieve a level of physical fitness that is commensurate with the physical requirements of Ranger missions.**
- **Understand and choose sound nutritional practices.**
- **Employ mental toughness skills to enhance personal and professional development.**
- **Receive screening/education for injury prevention and prompt, effective, and thorough treatment/rehabilitation of injuries when they do occur.**



RAW Philosophy

- The individual Ranger is the Regiment's most lethal weapon.
- You don't know how tough your next enemy will be. Assume he'll be very tough.
- You don't know exactly what the physical requirement will be on your next mission. Assume it will be extremely demanding.
- Ranger missions require strength, endurance, and movement skills…excelling in only one or two leaves you vulnerable to poor performance and/or injuries.
- Training hard is not enough; you have to train smart as well.
- As an individual, a team, a squad, or a platoon, you are only as strong as your weakest link. Don't have a weak link.
- Form matters. Master the exercise techniques and demand proper execution from your men.
- The body adapts to the stress you place upon it. This takes time. Cells aren't necessarily on the same schedule as your head and your heart. In other words, be consistent, be patient, and think of improvement over weeks and months, not days.
- Don't crush yourself everyday. Respect the need for recovery. RAW scheduling guidance builds in some degree of recovery, but leaders must be attuned to their men and modify the training stress appropriately.
- Fuel the machine. Don't train well then blow it with a lousy diet. Have a plan for hydration and meals/snacks and stick to it.
- Take care of your injuries before they become chronic. Playing hurt is necessary on occasion, but do it too long and there may not be a therapy or surgery fix.
- Keep your head in the game. Historically, warriors have been defined more by their minds than their bodies. Similarly, most athletes claim their performance is as much mental as physical, yet they seldom train or have a plan for developing mental toughness. Rangers need to recognize their ideal performance state and be able to call it up at a moment's notice.
- Learn all you can about your mind, your body, nutrition, and exercise, then apply that to the task at hand…making you and your Rangers the best tactical athletes on the planet.
- Bottom Line: Train right, eat right, sleep right, and keep your head in the game.

Principles of Exercise

- Progression: Following this principle means that you take a systematic approach to increasing the physical demands over time. For example, if your squad has been performing long runs of 35 minutes and you want to progress to 60, then you need a plan for doing so. The general rule-of-thumb is to progress time/distance by no more than 10% per week. When you do the math, you see that it will take about six weeks to safely progress from 35 to 60 minutes. The principle of gradual progression is just as important for resistance training. Start by mastering core stability and control of body-weight exercises. Add external resistance and/or volume (number of reps over a given period of time) gradually as long as control of the movement is well-maintained. Many injuries can be traced to attempting workouts that are beyond an individual's current capability.

- Regularity: This one is pretty obvious. Rangers don't generally have a problem with this. However, two points should be noted. First, if for whatever reason you cannot do PT for two or more consecutive weeks, assume you've lost some degree of fitness. You should then resume PT at a lower level and gradually build back up. Second, even though you may be doing PT on a regular basis, if you stop doing a particular component of PT (agility or plyometric training, for example), then you should re-master the basics of those drills before jumping back into an aggressive workout.

- Overload: To improve strength, endurance, or movement skills, you must provide a stimulus. This means moving outside your comfort zone…progressively lifting a little more, running a little faster or farther, practicing agility drills that don't come easy, etc. It is extremely easy to overload. The challenge is to do it intelligently. You must apply the principles of progression and recovery together with overload.

- Variety: Over the years, researchers and trainers have learned that athletes maximize their potential by dedicating a given period of time to a particular aspect of physical development, then changing the focus at regular intervals. For example, many strength programs begin with the focus on mass-producing workouts, later emphasize general power training, and finally move to activity-specific strength/power drills. Such regular changes to workouts force the body to continue adapting. If you stay with the same routine, the body becomes accustomed to it and development stops. Maintaining variety in a program also helps to control overuse injuries. If all of your endurance training comes from running, you are more susceptible to stress-related injuries (stress fracture, tendinitis, etc.). Finally, variety in physical training is absolutely necessary to be prepared for the broad-ranging physical requirements of Ranger missions.

- Recovery: The principle of recovery is closely related to the principles of overload and progression. Overload must be followed by some degree of recovery. Some workouts demand more recovery than others. Sessions that aggressively train speed, power, jumping/landing/cutting or heavy lifting should be followed by either a day of rest or PT than involves a moderate session of some other component (an easy run/swim and some mat-based core training, for example). Regarding progression and recovery, some periods, whether it is a day, a week, or several weeks, will involve PT that is relatively easy compared to the hardest days or training cycles. Another way of saying this is: you should not be red-lining every day nor burned out at the end of each week. Attempting to maintain maximal workouts for several months runs the risk of overtraining, which is related to not only muscles/bones/tendons stress injuries, but also disruption of hormonal balance. By incorporating relatively less training intensity and volume during a portion of the training cycle, the body is much less likely to breakdown.
- Balance: For Rangers, a balanced approach to PT scheduling means your program consistently incorporates training that develops strength, endurance, and movement skills (power, agility, coordination, etc). Taking this notion a step further, strength must be balanced by performing some workouts with body-weight resistance, some with moderate-heavy resistance, and some with a moderate resistance that is moved quickly (power training). Endurance should be balanced by performing a mix of aerobic and anaerobic training.
- Specificity: Following this principle ensures that you will be fit for the important stuff. Whenever the idea of fitness is discussed, the question "Fit for what?" should be part of the discussion. For Rangers, the answer is "Fit for current and potential Ranger training and combat missions." This doesn't mean that every workout must look like a combat mission. It does mean that you should always be aware of your big-picture PT objectives and understand how each workout, each week, each month of PT contribute to it. At least part of a training cycle needs to focus directly on tactical fitness. Such training must involve an operationally relevant degree of intensity and volume, but should be preceded by general fitness development (strength, endurance, movement skills).
- Precision: This term refers to the biomechanical correctness of movement. We know through observation and research that some movement patterns are efficient and effective, while other are inefficient and possibly destructive (over time, likely to lead to injury). For example, spinal stability not only protects the spine but also creates a stable base of support from which the arms and legs can generate power. Rangers should study and master optimal execution for all drills in the program. There will be times during training when we must push ourselves through fatigue and perhaps sacrifice perfect form. However, these should be the exceptions and not the everyday norms.

Understanding Movement Prep and Recovery

Movement preparation and recovery are vital pieces of the RAW PT program. In the past, they've been known as warm-up and cool-down. In keeping with the terms used by most top trainers, the names have been change to reflect the intent of the drills.

Movement preparation is a better term than warm-up. Preparing the body to move well is precisely the goal. Warming the body is part of movement prep, but it is no more important than the other two objectives of movement prep: loosening the joints/muscles, and priming the nerve to muscle messages. If warming were the only objective, you could sit in a sauna and call it warm-up. After movement prep, Rangers should be prepared to run, lift, negotiate obstacles, play a sport, execute a raid…

The movement prep recommended for Rangers is very similar to that used by top strength and conditioning coaches. It is somewhat different than the 5-step warm-up described in the Army's Physical Fitness Training FM (circa 1980s). While that warm-up was based on sound principles at the time, in the past decade research has shown that static stretching during warm-up is not necessary for injury prevention or performance.

The term recovery is used instead of cool-down. Similar to the idea of warm-up as only a component of movement prep, cooling down is only a small part of recovery. The objectives of recovery are 1) safely decrease heart-rate, respiratory rate, and body temperature, 2) improve functional flexibility; 3) replace nutrients, and 4) rest enough so that the body is ready for subsequent PT or missions.

Only the first two objectives are met on the PT field. This means that meeting objectives three and four are a personal responsibility. Leaders must educate and motivate their men to follow the nutritional and sleep guidelines put forth in the RAW classes.

It is clear that many individuals blow off cool-down and go straight to the shower without any obvious ill effects. Leaders should discourage this practice. Performing the functional flexibility exercises in the recovery drill will identify areas of tightness that might eventually lead to injury or limit performance. Those exercises were in fact designed to do just that. Obviously not everyone will need every stretch. However, those Rangers that do find areas of tightness or restriction during recovery stretches should be encouraged to repeat the stretches throughout the day.

Performing an organized recovery session offers squad leaders at least two other benefits: 1) the opportunity to provide the men with immediate feedback on the performance of the PT session, and 2) the opportunity to remind the men to re-hydrate and get the proper nutrients at the proper time.

To enhance recovery after PT, alternating heat and cold treatments may be of value. The easiest way to accomplish this is in the shower after PT. Another recovery enhancer that many Rangers find useful is the foam roll. Think of these tools as self-massage aids. See the battalion PT for further guidance on recovery practices.

Movement Prep

Purpose: Bring metabolism from rest to exercise levels, loosen the major joints and muscle groups, prime nerve-to-muscle messages that improve total-body coordination – all in preparation for any physical activity that follows.

Utilization: Before each PT session in all phases. Movement prep should be completed in about 10 minutes.

Execution: Calisthenics may be performed in an extended, rectangular formation for large groups or in a circle for squads. Perform 3-5 repetitions for each exercise, beginning with slow movements through an easy range-of-motion, adding just a little speed and range-of motion with each repetition. Perform the movement drills as indicate below, using an extended, rectangular formation. The last four movement drills are performed over a 20 meter distance. Pause as need between exercises to avoid fatigue. After movement prep, the body should be warm, loose and primed for intense activity – but not fatigued.

Calisthenics	Movement Drills
Bend and Reach	Side-Step Lunge (5 reps then reverse)
Around the World	Corkscrew Lunge (5 reps then reverse)
Squat	Walking Lunge & Reach (10 steps each leg)
Windmill	Walking Bend and Reach (10 steps each leg)
Leg Whips	Verticals (down and back)
Balance and Reach, Rearward	Laterals (down and back)
Pushup+/Pushups/Rotations	Crossovers (down and back)
Squat-Reach-Jump	Shuttle Run (down-back-down)

Movement Prep

Performed before all PT Sessions

Bend and Reach

- Start and finish with the arms overhead, abs engaged; don't lean backward.
- At the bottom of the movement, knees are bent, back round, head down looking and reaching between legs.
- Perform at a slow cadence.

Around the World

- Start and finish with the arms overhead, abs engaged.
- Perform slow, continuous, circular movements, especially stretching the side of the trunk.
- Perform clockwise and counterclockwise.

Squat

- Start and end with the arms in the ready position.
- Squat so that the knees are aligned over the toes, heels are down, the back is straight, the head and chest are up.

Windmill

- Start in a wide stance with the arms to the side at shoulder level.
- Begin to squat, then rotate the hips and trunk to reach toward the opposite foot.
- Stay balanced, with slightly more weight on the side of the reach.
- Keep the head and chest relatively up.

Leg Whips

- Begin with slow speed, short-range movements, forward/backward
- Keep the trunk steady and let the arms swing counter to the legs
- Gradually increase the speed and range of movement
- Switch to lateral leg whips; work both legs

Balance and Reach

- From a single-leg stance, reach back with the other leg while counter-balancing with a forward lean of the trunk.
- The stance knee remains centered over the ball of the foot; do not let the knee waiver side-to-side.
- If the left leg is reaching back, the left arm is reaching forward.

Pushup+/Pushups/Rotations

- Perform the PU+ (top two pics on the left) with the elbows straight, with the movement occurring through the shoulder blades.
- Perform 10 pushups.
- From the top of the PU+ position, raise the left hand toward the sky, pause for one second, then return to the starting position and switch sides. Feet are 12" apart on first rep, 6" on second rep, together 3rd rep.
- Keep the trunk straight and abs tight throughout.

Squat-Reach-Jump

- Perform 5 squats as per the guidance for the squat exercise
- Perform 5 reaches, rising out of the squat onto the toes, reaching overhead
- Perform 5 jumps. Landings should be soft (balls of the feet first, then sinking to heels), with impact absorbed by plenty of bend of the hips and knees. Keep the feet shoulder width apart or less. Do not allow the knees to buckle inward or outward upon landing.

Side-Step Lunge

- Squat first, then stay in the crouch and step to the side. A slight stretch should be felt in the groin as the trail leg straightens.
- Stay in the crouch with the trunk upright and bring the trail leg back to the squat position.
- After 5 side-steps, stand up to recover for a couple seconds, then repeat in the opposite direction.

Corkscrew Lunge

- Step to the rear with the trail leg, crossing it behind the forward leg.
- Leaving the legs in place, rotate the trunk back to the front (2ns pic), as you sink into a squat. A stretch will be felt in the glutes of the forward leg.
- Return to the starting position by pushing off the front leg.

Walking Lunge and Reach

- Perform a full forward lunge, keeping the trunk upright and the abs tight.
- Rotate the trunk toward the side of the forward leg and sink into the lunge position. A stretch should be felt in the hip flexors of the rear leg. Pause in this position for just 1-2 seconds.
- Rise out of the lunge using the power of the front leg, then step through to perform the exercise on the opposite side. Perform 5 lunges with each leg.

Walking Bend and Reach


- Step forward with the leg while bending forward at the waist.
- Keep the trunk as straight as possible while reaching toward the opposite foot. A gentle stretch should be felt in the hamstring of the forward leg.
- Rise slowly out of the stretch, then step through to perform the exercise on the opposite side. Perform 5 reps with each leg.

Verticals

- Also known as the high-knee drill. Take short, quick strides, stay on the balls of the feet. The knees rise to waist level.
- Use strong arm action. The elbows stay bent at 90 degrees and reach well to the rear during the backswing. The hand of the forward arm moves to about chin level.
- Keep the trunk perpendicular to the ground.
- Perform over 20 yards, down and back.

Laterals



- Start in the power stance crouch, on the balls of the feet.
- Move laterally with shuffle steps, keeping the feet directed to the front.
- Keep the back straight, the shoulder blades pulled slightly to the rear, and the hands in the ready position.
- Perform 20 yards in each direction.

Crossovers



- Same starting position as laterals, but move laterally with crossover steps. The trail leg crosses first to the front, then to the rear
- The arms stay in the ready position or move counter to the leg crossover
- Let the hips swivel rather than holding the trunk and pelvis stiffly.
- Perform 20 yards in each direction.

Shuttle Run


- Run at a moderate pace to the 20M line and back, staying with the squad leader, then on the last 20M segment, release into an 80% effort sprint.
- Always turn in the direction of the squad leader by making a half turn and crouching at the line, taking care to stay balanced and avoid twisting of the knees and ankle.

Recovery
Flexibility Drill

Purpose: Safely decrease heart-rate, respiratory rate, body temperature; improve functional flexibility; replace nutrients.

Utilization: After each PT session in all phases

Execution: Walk as needed to bring the heart rate back to within about 20-30 beats of the resting level, then finish with the exercises below. The exercises with an * are considered motion exercises rather than static stretches, and need only be held for 1-3 seconds, 3-4 reps each side. The other exercises are stretches and should be held for 15-30s, 1 rep. The last four stretches are performed in standing. Rangers that find tight muscle groups should be encouraged to stretch on their own throughout the day. The stretch routine also provides a good opportunity for squad leaders to give their men feedback on the PT session.

Immediately after the PT session, re-hydrate and restore nutrients. The optimal post-exercise meal for the RAW program meets the following criteria: 1) ingested within 30 minutes, 2) about 3:1 ratio of carbs to protein, 3) at least 250 calories.

Exercise Order:

Mountain Climber Stretch
Seated Hip Rotations*
Quadriceps Stretch (side-lying)
Posterior Hip Stretch (supine)
Scorpion*
Rotational Spine Stretch (supine)*
Prone Press*
Prayer Stretch w/Diagonals
Hip Flexor Stretch
Hamstring Stretch
2-Part Gastroc-Soleus Stretch (wall or partner)
Pectoralis Stretch (wall or partner)

Recovery Flexibility Drill

Performed after PT sessions and throughout the day as needed to improve mobility/flexibility

Mountain Climber Stretch

- Assume the starting position for the mountain climber exercise, except the forward foot is flat and the rearward leg fully extended.
- Keep the thigh of the forward leg tucked tightly into the trunk, then lift the arm on that side toward the sky, turning the trunk and head to look up.

Seated Hip Rotations

- From the position shown above, rotate the legs side to side.
- Keep the glutes and heels in place throughout the exercise.
- The trunk should face away from the direction of the knees.
- If form is good and the exercise is painless, advance to hands in the ready position or overhead.
- Perform slow movements from side to side rather than holding as a static stretch.

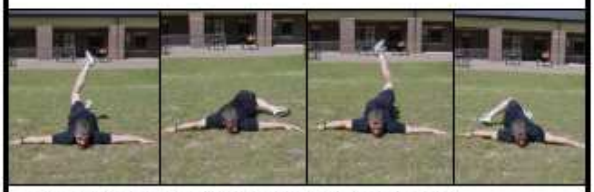
Quadriceps Stretch

- Pull the thigh to the rear without straining the knee joint.
- Keep the abs tight to prevent the trunk from arching.
- Keep upper thigh parallel to the ground (or lower) as you stretch it.
- The lower leg can be used to nudge the stretch leg farther to the rear.

Posterior Hip Stretch

- Cross the ankle over the opposite knee and reach between the legs to pull both toward the chest. A stretch should be felt in the glutes of the crossed leg.
- An alternate method (picture on the right), is to cross the ankle over the knee, then pull the knee of the crossed leg toward the opposite shoulder.
- For both versions, the non-stretch leg should exert slight pressure pushing the crossed leg toward the chest.

Scorpion



- Start in the prone position with the arms at the "T" position.
- Bend the left knee to 90 degrees, then lift the leg a few inches.
- Keeping the arms on the ground, slowly rotate the trunk to move the heel toward the opposite hand.
- Perform slow movements from side to side rather than holding as a stretching
- Pressure or fullness in the lower spine is ok, but don't perform if painful.

Rotational Spine Stretch


- Start in the supine position with the arms at the "T" position.
- Keeping the arms on the ground, slowly cross one leg over the other and rotate the trunk to move the foot toward the opposite hand.
- Perform slow movements from side to side. Pause only briefly at end range rather than holding as a static stretch.
- The hand can be used to gently pull the crossed leg slightly farther.

Prone Press

- From the prone position, press up leaving the legs, pelvis, and lower abdomen on the ground.
- Perform slow movement to the end range and pause briefly, rather than holding as a traditional static stretch.
- This exercise alternates with the Prayer Stretch. Perform three reps of each.

Prayer Stretch w/ Diagonals


- Move from the Prone Press directly to the prayer stretch, leaving the arms as far forward as possible and sitting back on the heels.
- The head should be down and the back muscles relaxed. This exercise can be used as a motion exercise by taking just a brief pause at end range, or it can be held for 15-30 seconds like a traditional stretch.
- Return to the Prone Press, then repeat with diagonal prayer stretches by crossing the left hand over right, then right over left.

Hip Flexor Stretch

- This stretch uses the same technique as the Walking Lunge and Reach from Movement Prep
- Perform a full forward lunge, keeping the trunk upright and the abs tight. It may also improve the stretch by contracting the glutes on the side of the stretch.
- Rotate the trunk toward the side of the forward leg and sink into the lunge position. A stretch should be felt in the hip flexors of the rear leg.

Hamstring Stretch

- This stretch uses the same technique as the Walking Bend and Reach from Movement Prep.
- Step forward with the leg while bending forward at the waist.
- Keep the trunk as straight as possible while reaching toward the opposite foot.
- The front knee should flex only slightly. A gentle stretch should be felt in the hamstring of the forward leg. Stop as soon as the stretch is felt.

2-Part Calf Stretch

- Use either a wall or a partner to create greater leverage for this stretch.
- For part one, the feet are directed straight toward the wall/partner. The back knee is straight, the heel is down and the pelvis is pushed forward. The stretch should be felt in the upper portion of the back of the calf of the rearward leg.
- For part two, the back leg is brought closer to the wall, the knee is bent, and the body is lowered to create a stretch on the lower portion of the calf of the back leg.

Pec Stretch

- Use either a wall or a partner to create greater leverage for this stretch.
- Place the forearm on the wall (lock hands and forearms if using the partner method), and turn slowly away until a stretch is felt in the chest. The leg on the stretch side is forward.
- Ensure that the stretch is felt in the Pec muscle, not the shoulder joint. Leaning into the wall/partner and changing the arm elevation (up or down) may be needed to transfer the stretch from the joint to the muscles.

Strength Training

BOTTOM LINE UP FRONT – RAW BULLETS FOR STRENGTH:

- Schedule 3 different strength workouts for every 7-10 day period: one heavy resistance workout, one power/power-endurance workout, and one muscular endurance workout.
- Leaders must ensure that every Ranger masters form for every strength training exercise.
- All functional strength training is core training…engage your core before and throughout every lift.
- The heavy resistance workout is based on the 4-rep max. This means that the fourth rep is completed with perfect form.
- The heavy resistance workout must balance pushing, pulling, and leg-dominant exercises. Don't over-emphasize the bench press.
- For the power/power-endurance workouts (Ground Base, cleans, Tabata intervals, etc.), don't add so much weight or so many reps that the speed of movement is compromised. Basically this means that the speed with which the movement is initiated is maintained until completion of the movement…or "start fast, finish fast."
- There are dozens of variations on the muscular endurance workout. If you are alternating pushing, pulling, legs, and core, you are meeting the intent.

Methodology for RAW Strength Training

No one questions the notion that Rangers should be strong. The questions are:

- What type of strength do we need?
- How strong do we need to be?
- How do we get that strong with limited time and equipment?

Strength is the ability to overcome resistance. The types of strength that Rangers need fall in to three basic categories:

1. Body Weight:
    - This starts with the ability to stabilize the main joints involved in an exercise so that movement is smooth and efficient rather than sloppy. Once you can stabilize, then build muscular endurance by increasing the volume of training (sets x reps) for exercises like push-ups, pull-ups, single-leg squats, lunges, and a variety of core exercises.

2. Heavy External Resistance:
    - This type of strength is needed to move loads. You must first be able to stabilize the joints used in the movement, but you don't have to wait until you've built up a given level of body-weight muscular endurance. Moderate to heavy lifting can begin early in a program as long as form is good and stability is maintained.
3. Power/Power Endurance:
    - This type of strength moves a load rapidly. The load may be your own body (ex: jumping onto an elevated platform) or an external load (ex: hoisting equipment onto an elevated platform). Power training is more demanding on the neuromuscular and skeletal systems, so stability, correct form, and adequate recovery are essential.

How strong do Rangers need to be? As with the other components of physical fitness, strength is useful to the extent that it improves your performance and keeps you injury free. There is no requirement to look like a bodybuilder or hoist weight like an Olympian. For Rangers, strength means being able to carry your combat load indefinitely, being able to carry the wounded man next to you, being able to get in the window or up the rope…These tasks and the many others Rangers will encounter require broad-spectrum strength.

For performance oriented strength training, the goal is the movement rather than the muscle. For example, a bodybuilder wanting to develop the quadriceps muscles may isolate that group on a machine that resists the straightening of the legs. The goal is muscular development and a visually pleasing shape. The bodybuilder is not concerned about the movement that caused the development. Contrast this with Rangers who, like athletes, need leg strength for lifting, lunging, climbing, and jumping. Now the concern is for the power of the movement, not the size or appearance of the muscle.

It is common to hear a strength coach describe an athlete that can step into a squat rack and work with more than 500 pounds, but can't do one correct single-leg squat with just their body weight. The difference is the much greater balance and stability demands of the single-leg squat. Balance and stability, especially of the core, are essential for developing functional strength. Informed athletes know that without a strong core their performance will suffer and they are more susceptible to injury. Top strength and conditioning coaches spend much more time emphasizing work on this area than on glamour exercises like the bench press and biceps curl.

The spine, pelvis, and hips are the core of the body. This area must be stable so that the limbs have a fixed base from which to create powerful movements. Without a strong, stable base of support, trying to generate power from the arms and legs is like pushing an object while on skates (or firing cannon from a canoe). The core is stabilized by a ring of muscles that loop around the spine and connect it to the pelvis. Even muscles like the glutes and lats play a big role via their attachments to the spine and pelvis. You are only as strong as your weakest link. Maxing the sit-up event doesn't mean you can stabilize the trunk. In fact there is evidence that concentrating on the sit-up and ignoring

the other muscle groups can actually hinder your ability to stabilize the core. We must train 360-degree abdominal/trunk strength, and in a manner that mimics the core's function.

Rangers just starting a resistance training program can get significantly stronger in just a few sessions, even before muscle mass increases. This is due to the fact that they have become more proficient at recruiting muscle fibers for the task. If we never attempt to meet heavy resistance, these nerve-to-muscle messages may not be very efficient. This is a common flaw in PT programs geared toward the APFT.

With heavy resistance, form becomes very important for both performance and safety. You must teach your soldiers safe lifting techniques and see them demonstrate correct lifts with a light weight. Realize that heavy resistance training for a given movement will require more rest (generally, about 48 hours) between bouts of exercise than will muscular endurance training.

Form is also important at lower levels of resistance. When we train for muscular endurance, changes are taking place at the cellular level that allow the working muscles to sustain their work for longer periods of time. Repetitions, by definition, are high for muscular endurance training. With repetition comes muscle memory, so form becomes very important toward ensuring that we "memorize" the correct movement.

It should come as no surprise that correct form is also a requirement for effective power training. In fact, creating optimal power is impossible without biomechanically-correct technique. In the RAW program, the Ground Base equipment is the primary tool for developing power. Although this equipment can support very heavy loads, we recommend that leaders use it for power training. Therefore, Rangers should keep the loads light enough that the speed of movement is not sacrificed. Resist the temptation to focus on the amount of weigh and instead focus on form and power.

Execution of RAW Strength Training

Muscular Endurance Workout

Purpose: Develop control of body weight from the ground, on the feet and from the air (pull up bar, ropes). Improve total body muscular endurance.

Utilization: This workout should be performed at least once during every 7-10 day period. Sessions should be completed in about 30 minutes. It is easily combined with a tempo run or 300-yard shuttle repeats for a complete PT session. This workout can be performed indoors or outdoors.

Execution: Perform the exercises in the order listed below. Perform all sets of each exercise before moving to the next. Emphasize mastery of exercise technique first, then gradually introduce more challenging movements (see progression below). Resistance can also be added once body-weight exercise becomes easy. This can be as easy as performing the workout in kit, holding dumbbells/barbell plates/sandbags, etc.

Exercises

- Single-leg Squat (2 sets, 15 reps each leg; adjust depth as needed)
- Pull-Ups/Ropes Tng (2 sets of 12 reps; partner or elastic band assistance as needed)
- Core (Supine Bicycle and/or Supine Twist (1 set, 1 minute)
- Single-leg Stiff-leg Deadlift (1 set, 15 reps each leg; adjust range-of-motion as needed)
- Nordic Hamstring (Kneeling w/partner hold at ankle; use pads at knees as needed; 1 set of 15 reps)
- Push-ups (1 Ranger pushing, 1 spotting; perform 3 sets at 60, 40, and 30 seconds each)
- Hanging Crunches (2 sets of 12 reps; partner assistance as needed)
- Star Lunge Series (2 sets of 5 reps each direction – see execution note below)
- Pull-ups/Push-ups (1 set each, max good reps with only transitional rest in between)
- Core (Planks, Side-planks)

Note 1: If medicine balls are available, parts of the MedBall drill can be used in place of sit-ups, supine bicycle/twist.

Note 2: Perform the Star Lunge Series as follows: 1) Left leg forward, forward-diagonal, lateral; 2) Right leg forward, forward-diagonal, lateral; 3) Left leg lateral, backward-diagonal, rear (reaching with right leg), 4) Right leg lateral, backward-diagonal, rear (reaching with left leg). 5) Repeat all of the above for a second set.

Progression

- Add resistance to single-leg exercises/lunges (med balls, dumbbells/kettlebells, plates, and pull-ups (RBA).
- Combine forward and rear lunges. For example, perform a forward lunge with the left leg then pass the starting position without stopping to go into a rear lunge in which the left leg steps back, but the weight remains on the right leg. Repeat for one minute, rest 30 seconds, then repeat for the opposite side. Use the first three reps to establish form, then continue at a moderate to fast pace.
- 3-Point Pushup (60-40-30s sets with 60-40-30s rest; 1 Ranger pushing, 1 spotting)

Alternatives

- There are plenty of alternatives to the muscular endurance workout described above. When evaluating other routines, look for the following:
    - pushing and pulling movements for the upper body
    - a variety of core exercises targeting different areas
    - a variety of functional leg exercises (squats, lunges, single-leg step-ups)
    - a reasonable volume of training (a workout that calls for 50 reps when you can only do 20 good reps is not reasonable)
    - a reasonable load based on your individual abilities, not what some guy with a website has published as “the standard”
    - a reasonable degree of recovery built into the workout (you should feel like your stamina is being challenged throughout the workout, but not so much that movements become sloppy…take short breaks as needed to regain some energy)

Strength

Muscle Endurance Drill

Single-leg Squat

- Perform 2 sets of 15 reps for each leg.
- Squat as low as possible without breaking form, then pause for 1-2 seconds. Return smoothly to the starting position.
- At the bottom of the squat, the knee is aligned over the ball of the foot (note the alignment markers in the pictures above. The back should be straight, but the trunk is tilted forward to counterbalance the rearward movement of the hips.

Pull-Ups

- In buddy teams, perform 2 sets of 12 reps. Chin-ups or rope pulls may be substituted depending on your training objectives.
- Do not kip; use partner assistance as needed.
- Return to the straight arm position after each repetition, but do not go to a complete dead hand...maintain some tension through the shoulders.

Supine Bicycle

- Perform 1 set for 1 minute.
- Perform at a slow pace without jerking on the neck.
- Attempt to touch the elbow to the opposite knee.
- Reach as far as possible with the straight leg and lower it slowly to within a few inches of the ground.
- Do not allow the low back to arch off the ground.

Single-Leg Stiff-leg Deadlift

- Stand on one leg. Keeping the trunk straight, lean forward and reach toward the opposite foot as the free leg is raised in line with the trunk.
- The stance knee is slightly bent and remains in that position throughout the exercise.
- Perform 1 set of 15 reps on each leg, using slow, controlled movements.

Nordic Hamstring

- Perform in buddy teams as shown above; 1 set of 15 progressive reps.
- Do not bend at the waist; keep the trunk and thighs lined up as shown in the second picture.
- The first few repetitions involve leaning forward without going to the ground. Once you reach an angle from which you are unable to return to the starting position, allow the straight trunk to fall forward and use a plyo push-up to return to the starting position.

Pushups


- 1 Ranger pushing, 1 spotting/giving feedback; perform 3 sets at 60, 40, and 30 seconds each
- Do not rest or move out of a tight front-leaning-rest position; spotters assist as needed with the minimal amount of lift at the waist.

Hanging Crunches/Heel Claps

- This exercise can be performed from a bar or rope
- Perform 2 sets of 12 reps in buddy teams; one spotter, one executing.
- Maintain the flexed-elbow position and lift the knees to the elbows. Spotters assist as needed on the "up" phase of the exercise.
- Maintain control throughout the exercise- do no let the body sway back and forth, or use momentum to get knees up.
- An advanced technique on the pull-up bar is to tap the heels over the bar.


Star Lunges

Forward Front Diagonal Lateral Back Diagonal Rear

- Perform 5 reps each in order: 1) Left leg forward, front-diagonal, lateral; 2) Right leg forward, front-diagonal, lateral; 3) Left leg lateral, back-diagonal, rear (reaching with right leg). 4) Right leg lateral, backward-diagonal, rear (reaching with left leg). 5) Repeat all of the above for a second set.
- For every repetition, the knee of the working leg should be aligned directly above the ball of the foot at the end range position. Push vigorously from the working leg to return to the starting position; do not jerk the trunk.

Pull-Ups & Push-Ups


- Perform as many good pull-ups as possible
- Rest 30 seconds
- Perform as many no-rest push-ups as possible.

Planks


Perform at least one minute of planks, alternating between regular planks and side-planks.

Heavy Resistance Workout

Purpose: Develop total-body muscular strength. This is not meant to be a body-builder's workout. Lifts that involve multiple joints and muscle groups are the standard.

Utilization: At least once every 7-10 days in all phases. There are no phase-specific changes. Instead, individuals progress the resistance based on their performance.

Execution: There are two main options for strength training - the gym-based method and the field-expedient method.

- Gym-Based Method: Execution depends on the time available.

    1. No time constraint

The following guidelines apply if you have plenty of time for strength training (deployed, split PT sessions, etc).

- Over the course of a week, balance upper and lower body lifting
- Over the course of a week, balance push and pull lifting
- Work the upper body 1-3x/week
- Work the legs 1-2x/week
- Each month, change the workout in some way. One option is to change the lifts (Ex. Switch from seated row to single-arm bent-over rows.) Another option is to switch from heavy resistance (based on a 4-rep max) with relatively long recovery between sets to an 8-10-rep max with a relatively short recovery. Another options is to superset (one example is to immediately follow a push lift with a pull exercise)
- If performing split routines, they should be arranged according to push/pull functions. For example one day chest and triceps, the next day back and biceps. Because the stabilizers of the shoulder are highly stressed during a chest workout, avoid a hard isolated shoulder workout the day before or after the chest. It's probably best to work the shoulders on chest day as part of the pushing function. Keep in mind that this type of training that isolates muscle groups is not necessary for functional strength. Though some Rangers may benefit from increasing their overall mass with such routines, they must supplement these routines with functional, total-body movements.
- Your max bench press should not be considered the most important measure of your strength. Most of the time when you have to push something heavy, you will get your legs into it. That's why we prefer Ground Base, push press with dumbbells, and other total body lifts. Heavy

benching carries a risk of injury to the shoulder, both for pec and rotator cuff strains/tears and long-term degeneration.

2. Time Constraint
   If all squads from a given company are performing this session during the same time period (a typical garrison, 90-minute AM PT session), then strength training needs to be limited to about 20 minutes per platoon in order to accommodate three platoons in one hour. For example, after movement prep, the squads from first platoon have the weight room for 20 minutes, while squads from the other platoons are on the field doing something else. The squads rotate at 20 and 40 minutes. The 20-minute sessions proceed as follows:

   - Perform a warm-up set at about 50% of 4-rep max.
   - Perform the second set at about 75% of 4-rep max.
   - Perform 2 sets at 4-rep max. Adjust the weight so that the fourth rep is the last rep that can be completed with perfect form. Do not continue to muscle failure or allow a repetition that involves jerking or other compensatory movements. Each set will last about 15-20 seconds. Each individual should have 60 seconds rests between sets, for a 1:3-4 work-to-rest ratio. Finish all sets before moving to the next station.

Notes:

- In the Legs/Back and Pull categories, change lifts after 4-5 sessions. For example, Rangers that have been performing the Deadlift and Seated Cable Row will switch to the Stiff-leg Deadlift and Lat Pull-down.
- Pre-position weights to allow time-efficient changing out of weights for lifts that use barbells/dumbbells. Remember, there will generally only be about 6-7 minutes per station.

Pick one Exercise from each Category

Push	Legs/Back	Pull
Bench Press	Deadlift	Seated Cable Row
Seated Press	Stiff-leg Deadlift	Lat Pull-down
Dumbbell Press*	Leg Press	Seated Machine Row
		Bent-Over Row

*Only performed by experienced lifters.

For the barbell deadlift, the feet are under the bar, the back straight, shoulders pulled back and aligned over the bar, heels down, hips low, head and chest up, and arms outside the legs. Breathe in and hold, push through the heels to rise to a fully upright stance. Breathe out as you pass through the most difficult part of the lift. Keep the bar as close to the body as possible. Attempt to rise as a unit, rather than with the hips first, then the upper body. There is no need to lean backward at the top.

- Field-Expedient Method:

1. The principles of strength training used in the weight room still apply when conducting field-expedient strength training. In other words, push and pull, work upper and lower body. Resistance comes from your body weight, your kit, sandbags, kettle bells, etc.

2. Working push strength means adding a challenge to the standard pushup. There are many ways to do this: 3-point PU, wearing your rack, partner resistance, elastic band resistance, elevated PU (partner holds your feet at his waist level), partner puts a sandbag on your back, or any combination of the above.

3. Working pull strength is a little more straight forward. Perform pull-ups, chin-ups, alternating grip pull-ups…perform in kit in phases 2 and 3. Also perform ropes training without the use of your legs. Use dip bars to perform horizontal pulls (partner holds your feet or you hook them over the dip bars).

4. Leg strength is best trained in the field-expedient environment by isolating one leg. After your men master the single-leg squat and lunges with body weight, they should increase resistance in one of two ways – either add weight (kit, sandbag, etc.) and perform exactly the same, or progress to step ups. To perform step ups, first identify an appropriate height. When the foot is placed on the step, your thigh should be roughly parallel with the ground. Perform by placing one leg on the step, leaning

forward, powering up with the lead leg only, then slowly lowering the body to just barely touch the back leg down.

Perform several sets of exercises in each category. Add resistance when perfect form can be held for 12 or more reps.

Power and Power-Endurance Workouts

Ground Base Equipment

Purpose: Develop total body power-endurance using functional movements.

Utilization: Once or twice per week in all phases. If the BN is scheduling one company per day to use the Ground Base equipment, then this session should last no more than 20 minutes in order to accommodate three platoons in one hour. Even when used in small groups without time constraint, an effective circuit(s) can be completed in 15-30 minutes.

Execution:

1) This first option assumes battalion-level scheduling to maximize use of the Ground Base equipment. Battalions should provide 3 stations for each of the six lifts listed below. Arrange the weight room for ease of transition. For battalions that use the rotating schedule and dedicate a company per day for the Ground Base workout, it is best to set up the machines in advance – one set of machines each at light, medium, and heavy levels of resistance. Platoons are sent through one at a time, switching out at 20 minutes. There are 2 Rangers at each station – 1 performing and 1 resting. After both Rangers have completed the lift, move to the next station. Complete the entire circuit twice, with a 2-3 minute break between iterations. During this break, switch the weights for the Combo Incline and Combo Decline in order to work the opposite side. Do not perform any of the Ground Base lifts to muscle failure or allow a repetition that involves jerking or other compensatory movements. The primary means of progression is through speed of movement and increased duration of sets. Initially (Phase 1) adjust the weight so that 20 seconds of work can be completed with perfect form. Progress by either adding weight or performing for 30 seconds (Phases 2 & 3). For larger elements, 3 Rangers per station may be necessary to finish in 20 minutes. Under those circumstances, continue to use 20-second work cycles.

   The Six Stations:

   R Combo Twist
   L Combo Twist
   Combo Incline (1st Set L, 2nd Set R)
   Combo Decline (1st Set L, 2nd Set R)
   Zero Woodchopper Up (1st Set L, 2nd Set R)
   Jammer

2) When performing a Ground Base workout individually or in small groups with no time/equipment constraints, you need not use the circuit method described above. One option is to use the Tabata interval method, using 20s of work followed by 10s of rest, with 8 repetitions (total of four minutes). There

are numerous variations using Ground Base. We suggest dedicating a Tabata round (4 minutes) alternating left and right movements for two lifts (combo twist, woodchopper up, incline/decline, etc). The round should be followed by several minutes rest, then a second round using another lift. Repeat until all desired lifts are completed or until fatigue sacrifices movement speed/proficiency.

You can also adjust the sets/reps to stress power more than power-endurance. For example, once you have mastered form, add enough weight to decrease the reps to the 3-5 rep range. Do not add so much weight that speed of movement is lost…remember this is a power workout. To maintain precision of movement with this heavier load, allow adequate recovery between sets (generally 1-3 minutes).

Strength Training

Ground Base Equipment

- The first six exercises constitute the GB Circuit described in the text.
- The squat high pull and zero woodchopper down are not included in the circuit, but are also valuable lifts and may be included, time permitting.
- The deadlifts on GB equipment are a part of the moderate-heavy resistance workout

Right Combo Twist

- Start in the power stance crouch with the left leg forward. The core muscles should be contracted and ready.
- Power the movement by rising out of the crouch, twisting through pelvis and trunk, and finishing with the arm movements.

Left Combo Twist

- Start in the power stance crouch with the right leg forward. The core muscles should be contracted and ready.
- Power the movement by rising out of the crouch, twisting through pelvis and trunk, and finishing with the arm movements.

Combo Incline

- For the left combo incline, start in the power stance crouch with the left leg forward. The core muscles should be contracted and ready.
- Power the movement by rising forcefully out of the crouch, twisting through pelvis and trunk, and finishing with the arm movements.
- Perform an equal number of left and right combo incline sets.

Combo Decline

- The parallel stance position generally works better than a staggered stance. The core muscles should be contracted and ready.
- Power the movement primarily by pushing/pulling with the arms, with only a slight twisting through pelvis and trunk. The core remains tight throughout.
- Perform an equal number of left and right combo incline sets.

Jammer

- Start in a power stance crouch, with the feet parallel. The core muscles should be contracted and ready.
- Power the lift with an explosive push through the legs, finishing with the pressing movement. The trunk must remain straight at all times.
- Do not allow the spine arch, as this may cause spinal injury.

Zero WoodChopper Up

- Start in a well-balanced crouch, either facing the handle or angled slightly away from the machine. The back is straight, and the head and chest are up. The core muscles should be contracted and ready.
- Power the lift with an explosive push through the legs, creating enough momentum so that you can pivot on the balls of the feet during the mid-range.
- Finish by releasing the lower hand and guiding the weight up with a pressing motion keeping the back straight and the abdominals engaged.

Zero WoodChopper Down

- With the handle in the up position, grab it with both hands (outside hand on top), with the weight on the forward foot as shown in the picture on the left. The core muscles should be contracted and ready.
- Explosively shift your weight to the rear and pull, creating enough momentum so that you can pivot on the balls of the feet during the mid-range.
- Finish by releasing the upper hand and guiding the weight down to the bumper. At the finish, you are in a strong lunge position with the back straight, the abdominals engaged, and the elbow straight.

Squat High Pull

- Face one side of the Ground Base Squat machine. Grab the handle with the hand closest to the machine. Assume a deep squat with the back straight and the head and chest up. The core muscles should be contracted and ready.
- Explosively rise out of the squat, shrug/pulling with the shoulders. Do not allow the hand to rise above shoulder level.

Ground Base Deadlift

- The Ground Base Deadlift station is recommended for all inexperienced lifters
- Begin in a deep squat with the heels down, back straight, core muscles tight, and head and chest up.
- Take a deep breath in and hold it. Rise out of the squat by pushing through the heels. Keep the back straight and chest high.
- Release the breath once after clearing the most difficult part of the lift (sticking point).
- Do not arch the back at the end of the lift. This is only necessary for competition.

Ground Base Stiff-Leg Deadlift

- The Ground Base Deadlift station is recommended for all inexperienced lifters
- Begin with the heels down, back straight, core muscles tight, and head and chest up. Knees are only slightly flexed.
- Take a deep breath in and hold it. Rise out of the squat by pushing through the heels. Keep the back straight and chest high.
- Release the breath once after clearing the most difficult part of the lift (sticking point).
- Do not arch the back at the end of the lift.

Power Drill (Although it is described here in the strength section, this drill is listed on the PT Events Chart under Movement Skills and is best scheduled in conjunction with one of the three main strength workouts.)

The first time this drill is performed, the movements must be taught, so there may not be much of a training effect other than learning. Emphasis is on correct execution, not creating a smoke session. The work-to-rest ratio should begin at about 1:4 for each exercise. Add speed/intensity and shorter recovery only after the basic skill is mastered.

The foundational movement for all jumps is the power position, with hips to the rear, knees over feet, heels down, back straight but trunk tilting forward. Body weight is primarily on the balls of the feet. Landings should be soft, with impact absorbed by plenty of bend of the hips and knees. Keep the feet shoulder width apart or less. Do not allow the knees to buckle inward or outward upon landing.

For the med ball throws, perform in pairs, with two ranks facing. For safety purposes, it is best to only throw on command from the squad leader, with throws going from one rank to another rather than randomly. See the individual drills below for details.

<u>Exercises:</u>

- Sprints: Build to an 80-90% effort over the first 20 yards, then maintain for a total of 60-80 yards. Rest for 15-30 seconds. Perform 6-10 reps.
- Broad Jump: 3 w/pause, then 7 continuous; repeat 2-3X
- Lateral Hop, Double-leg over cone: max # in 10s, 40s rest, then repeat
- Modified Squat Jumper: 3 w/pause between reps, then 8-10 continuous
- Split-Squat Jump: 8 reps each leg
- Plyo Push-up (8-10 reps with partner assist as needed)
- 90/180 Jumps: 3 w/pause, then 8-10 continuous
- MedBall Throws for Distance (underhand, backward-overhead, chest push, rotation L/R)

<u>Late Phase 2 and 3 Additions</u>

- Scissors Jump w/rotation (in place of Split-Squat Jump): Sprint 10M after 5^{th} rep. Add MedBall only if perfect execution

Power Drill

So that optimal form is maintained throughout this drill, ensure adequate rest between sets. This is especially important when mastering these movements. Realize there are many other power movements that fit nicely into this drill Ball slams and tire flips are two examples.

Power Drill-Sprints

- Build to an 80-90% effort over the first 20 yards, then maintain for a total of 60-80 yards. Rest for 15-30 seconds. Perform 6-10 reps.

Power Drill - Broad Jumps

- Start and finish in the power position.
- Stick the landing and pause for the first 3 jumps, then perform 5 continuous jumps
- Repeat 2-3X

Power Drill - Lateral Hop

- Perform double-leg jumps over cones. Note that the feet remain within about 6 inches apart and directed forward.
- Perform the maximum number of reps in 10 seconds. Rest 40 seconds, then repeat.

Power Drill-Modified Burpee

- From a regular stance (1) perform a modified squat thrust. Do not stop in the front leaning rest position. Instead drop directly into position 2 above.
- Jump quickly back to a crouch (3) and, without pause, jump forcefully, extending the arms overhead (4).
- Land back in the power position (3). Stick the landing and return to the starting position for the first 3 reps, then perform 8-10 continuous reps. For the continuous reps, do not return to the starting position between reps.

Power Drill- Split-Squat Jump

- From a staggered stance, with 80% of body-weight on the front leg, jump vigorously and extend the arms overhead.
- Land softly back in the starting position by getting plenty of impact absorption from the bending of the hips and knees.

Power Drill- Plyometric Pushup

- Start in the front leaning rest position. Drop quickly to within a few inches of the ground, then explode upward with enough force that the hands leave the ground
- Do not pause in the front leaning rest once you begin the exercise.
- Maintain a tight core throughout.
- Perform 2 sets of 8-10 reps with partner assist as needed.

Power Drill- 90-180 Jumps

- From the power stance, jump vigorously and extend the arms overhead while rotating the body 90 degrees to the right.
- Land softly by getting plenty of impact absorption from the bending of the hips and knees. Continue with several jumps clockwise, attempting to land at exactly the 90-degree mark. Repeat in the counter-clockwise direction. Progress to 180 degree jumps.

MED BALL THROWS - Underhand

- Raise the ball overhead, then quickly drop into the power position with the arms extended.
- Without pause, explode out of the power position to throw the ball in a 45-degree arc. You should land 2-3 feet in front of the starting position.
- This drill is normally performed with a partner about 15-20 yards away, positioned to catch the ball on one bounce. Do not attempt to catch in the air. When performed in larger groups, it is best to have one rank at a time throw on command.

MED BALL THROWS
Backward Over-Head

- Raise the ball overhead, then quickly drop into the power position with the arms extended.
- Without pause, explode out of the power position to throw the ball in a 45-degree arc overhead.
- This drill is performed with a partner about 20 yards away, positioned to catch the ball on one bounce. Do not attempt to catch in the air. When performed in larger groups, it is best to have one rank at a time throw on command.

MED BALL THROWS
Chest Push

- Pull the ball into the chest as you squat.
- Without pause, explode out of the power position to throw the ball in a 45-degree arc. You should land 2-3 feet in front of the starting position.
- This drill is normally performed with a partner about 15 yards away, positioned to catch the ball on one bounce. Do not attempt to catch in the air. When performed in larger groups, it is best to have one rank at a time throw on command.

MED BALL THROWS
Rotation L/R

- Raise the ball overhead toward your partner, then quickly drop into the rotated power position with the arms extended (middle photo)
- Without pause, explode out of the this position to throw the ball in a 45-degree arc. You should land 1-2 feet in front of the starting position. Perform an equal number of R/L throws.
- This drill is performed with a partner about 20 yards away, positioned to catch the ball on one bounce. Do not attempt to catch in the air. When performed in larger groups, it is best to have one rank at a time throw on command.

Power Drill
Scissors Jump w/Rotation

- From a staggered stance, with 80% of body-weight on the front leg and the med ball held to the outside of the front thigh, jump vigorously and swing the ball to the opposite side while "scissoring" the legs.
- Land softly by getting plenty of impact absorption from the bending of the hips and knees.

Other Power and Power-Endurance Workouts

- **Tabata Intervals** are named after the author of a famous study that proved high-intensity intervals of short duration (20s), with an even shorter rest (10s), repeated 8 times, could significantly improve ***both*** anaerobic and aerobic endurance over six weeks (5x/week). These results were compared to a group that trained at a steady pace for one hour, 5X/week at 70% of aerobic capacity. The steady-pace, moderate intensity training did not improve anaerobic capacity. While the Tabata research was performed on a cycle ergometer, a similar effect can be had performing a variety of powerful movements using body weight and/or external resistance. There are several possible applications of Tabata intervals within RAW. A single round (20s work, 10s rest x 8 reps = 4 minutes) can easily be combined with another "main" training event. Even two rounds with a 2-minute rest between rounds only demands 10 minutes. There are dozens of potential exercises that can be used for Tabata intervals. We like the following:

    - Modified Burpees
    - MedBall (Short and Medium Range Throws)
    - Suicides (25m x3 equals roughly 20 seconds…adjust according to your speed)
    - Squat Thrusters
    - Tire Flips (with or without in/out jumps)
    - Skedco/Sled Pulls
    - Kettle Bell Swings
    - Kettle Bell Pull (20 yards of rope, 50-60 lbs of kettle bell, hand-over-hand pull)
    - Kettle Bell Snatch (Alternating sides each 20s round)

- The **Olympic lifts** (Snatch and Clean and Jerk) are highly specialized lifts that are proven means of increasing power. However, they are technically demanding lifts that when performed incorrectly can lead to injury. While many top strength coaches use these lifts as a main focus of training with their non-Olympic Lift athletes, just as many coaches recommend their use only for those athletes training in the sport of Olympic Lifting. We agree with this latter group and don't believe the lifts are necessary for Rangers.

  Since there are many other ways to develop power, our guidance is to use other, less technically demanding training methods. The National Strength and Conditioning Association has a video resource that includes many power-developing lifts. Go to < http://www.nsca-lift.org/videos/displayvideos.asp> for the videos. Do not overestimate your ability. Take the time to master the technique, then apply the principles of exercise discussed previously. Make sure your gym has lighter plates (10 or 15#) with which to master these techniques (same diameter as the typical 45# plate). Before attempting these drills, Rangers should first spend 2-3 months mastering and then progressing the 360-Core, MedBall, Muscular Endurance, Moderate-Heavy resistance, and Ground Base workouts.

Generally power workout incorporate several sets of 3-5 repetitions for each exercise. Sufficient rest between sets ensures that technique remains uncompromised by fatigue. Up to three minutes rest between sets may be necessary. Once the technique is mastered, focus on moving the bar as quickly as possible. Loads of 75-95% of 1RM will result in increased maximum strength, while loads of 50-60% of 1RM, performed ballistically, will result in increased maximum power. Once an athlete has reached high strength levels, maximum power training may be more conducive to peak athletic performance than further increases in max strength.

Principles of Endurance Training

BOTTOM LINE UP FRONT – RAW BULLETS FOR ENDURANCE:

- Schedule 3 different endurance-emphasis workouts for every 7-10 day period.
- Once per week (except on recovery weeks) perform interval training of some sort (30-30s, track intervals, pool intervals, etc).
- Progress time/distance/interval reps by no more than 10% per week.
- Don't run hard and/or long on consecutive days unless you have a good reason for doing so (you are an experienced runner training for a running event).
- During recovery weeks (generally one for every 4 or 5 weeks of hard training), replace intervals, long runs, and foot marches with pool workouts and cardio machines.

Methodology for RAW Endurance Training

For our purposes, endurance is the ability to sustain physical activity. Sometimes the activity is intense and can only be sustained for a relatively short time. With some recovery, the activity can then be repeated. This is anaerobic endurance and is reflective of many combat tasks that involve repeating quick, powerful movements. At other times, the task may be less intense but require continuous movement (ex. foot movement to an objective several km away). This type of endurance is aerobic in nature.

Most activities are not purely aerobic or anaerobic, but a mix of the two. Interestingly, training anaerobically will improve aerobic capacity. However, the reverse is not true. For this reason, it is a mistake to train only the aerobic system when missions require full-spectrum endurance.

In the RAW program, endurance is trained primarily through running, footmarches, and swimming. However, it is important to note that an anaerobic training effect is also occurring during many other drills if intensity is maintained. This is especially true with MedBall, agility, and power drills; ground base training; circuits; and Tabata Intervals (described in the Strength section).

To enhance endurance during drills other than running, foot marching, and swimming, reduces the amount of rest time between sets or events. This should only be done after the men have mastered the basic drills. Using the MedBall drill as an example, it is best to keep the relatively long rest time between sets during the initial train up in phase one. This reduces sloppy movement due to fatigue and promotes mastery of the

techniques. By phase two, technique should be sufficient to allow a reduction in rest time between sets.

Execution of RAW Endurance Training

1. **Sustained-pace run of 30-60 minutes**

   The purpose of this run is to build aerobic endurance and gradually toughen the legs. In Phase 1, keep the time around 30 minutes. Starting in Phase 2, gradually progress the time/distance based on your needs. A good rule of thumb is to increase running distance by no more than 10 percent per week. Thus, adding about 3-4 minutes per week is reasonable way to get from the 30-minute runs in Phase 1 to 60-minute runs at the end of Phase 2. Be aware that the risk of overuse injuries rises with the time spent running. Squad leaders must weigh the benefit of running greater than 5 miles with the risk of creating lower extremity injuries.

2. **Intervals**

   The purpose of interval training is to build anaerobic endurance and leg power.

   Phase 1 - 30/30s

   The 30/30 run is named for the run/rest ratio – 30 seconds running pretty hard, 30 seconds walking. The pace for the running should be about 80-90% of your maximum effort, not maximum heart rate. The running portion of the 30/30s should feel like a hard effort that falls short of a full-out sprint. Concentrate on running with good form – head up, shoulders relaxed, trunk directly over the pelvis, arm swing moderate and in line with the direction of travel.

   30/30s are the primary form of interval training in phase one and should be performed once per week. In the first few weeks of phase one, perform 10 reps, take a 4-5 minute walking break, then repeat 10 more reps. Add a couple reps to each set during the last weeks of phase one.

   Phase 2 & 3 – Track Intervals

   Track intervals are a staple of middle and long distance running programs. They are a proven method of improving aerobic and anaerobic fitness and should be included weekly in phases two and three. Use the chart below as a guide to interval training. You may run all intervals at a particular distance or mix in a few of each. Systematically progress the number of intervals over the course of phases two and three. Over the course of phases two and three, you should perform some sessions at each distance.

Distance (meters)	Effort*	# if Intervals	Rest Between Intervals (minutes)
200	90%	15-20	1.5 - 2
400	80%	6-12	1.5 - 3
800	2-mile race pace	3-6	2-3

If a track is not available, base the interval on time:

Time (min:sec)	Effort*	# of Intervals	Rest Between Intervals (minutes)
0:45	90%	15-20	1.5 - 2
1:30	80%	6-12	1.5 - 3
3:00	2-mile race pace	3-6	2-3

*Effort level is used to establish pace. This is a mental calculation taken during the middle portion of the first repetition. The bottom line is to 1) finish the prescribed number of intervals, 2) maintain good running form throughout, 3) have essentially the same time for each interval, and 4) feel that you've challenged yourself.

3. Tempo Run

These runs improve your endurance by increasing your lactic threshold. In effect, you are training your cells to better deal with the natural by-products of running at a relatively high intensity. For our purposes the duration at tempo speed should be about 20 minutes. These runs should be preceded by movement prep and then five minutes of easy jogging. The pace should feel comfortably hard. Basically, you are running just a little below your race pace. So, if you rated a race as 10/10 effort, tempo runs are about an 8/10 effort. If using a heart-rate monitor, stay in the 85-90% of maximum heart rate range. Unless you are training for ½ marathons and beyond, there is no real need to increase the 20-minute duration. Instead, gradually increase the tempo.

4. Fartlek Run

These runs can be used in a variety of ways to build both aerobic and anaerobic endurance. They also should improve your sense of pacing. Fartlek runs are a form of interval training. Periods of faster-paced running are alternated with a slower pace that allows some recovery. Limit these runs to about 30 minutes. Fartleks allow the squad leader maximum flexibility to challenge his Rangers. If available, incorporate hills into the fartlek run by attacking the hill then recovery at the top. Repeats on the same hill are not considered fartlek training, but can occasionally be substituted for fartleks.

Secondary Runs

5. 300-yard Shuttle Run Repeats

This run should be used in conjunction with other non-running workouts. For example, it is a good supplement to a workout from the strength or tactical categories.

Beginning from a crouch start, run three complete round trips between two lines spaced 50 yards apart for a total of 300 yards. Turn by placing at least one foot on or over the line at each turn. Turn to the right for the first change of direction then alternate L/R for the remaining turns. On the final trip, sprint past the Start/Finish Line. Perform repeats with 2-minute recovery breaks between reps. This drill can also be performed over a 25-yard field, using six down-and-backs.

6. Terrain Run

Terrain (cross-country) runs accustom the men to uneven terrain and slopes. This in turn trains the stabilizing muscles of the legs and core that keep the body balanced on uneven terrain. In addition, hill terrain contributes to lower extremity strength/endurance.

Leaders should use these runs judiciously because they carry a higher risk for ankle and knee sprains. Consider the risk during dark or wet conditions. If you choose very rough terrain, it's best to wear boots and keep the duration short. For easier terrain such as a golf course or dirt trail, running shoes and a longer duration are fine. Relatively short terrain runs are a good supplement to workouts from the strength or battle-focus categories.

7. Foot Marching

Purpose: Develop aerobic endurance with load; toughen the feet;

Utilization: Generally twice per month throughout the three phases (Once on even terrain and the other on an uneven trail).

Execution: In Phase 1, the footmarch should cover a distance of no greater than 6 miles with the RF1 packing list not to exceed 45 lbs. In Phases 2 and 3, leaders gradually increase the distance and load. Long distance footmarching (15+ miles) should be considered for the development of mental toughness. Such footmarches carry a risk that should be considered and mitigated. The risk for breaking down Rangers can be mitigated by 1) no PT or other high physical demands 1-2 days before and two days after the event, 2) only performing the long marches in the later phases of the program, after core strength has been established, 3) following best practices for foot care and tactical pauses along the march, 3) following good

hydration/nutrient replacement practices, 4) ensuring individuals Rangers have had success at the 12-mile distance first.

Power Ruck

Purpose: Improve movement techniques under load while challenging anaerobic power endurance.

Utilization: Used 1-2X/month in all phases. Best used in conjunction with other Tactical PT Drills (Ex. Casualty Evac)

Execution: The assault pack is the preferred load, as it allows for greater speed of movement; however, other load sizes and configurations may be appropriate depending on the goal of the training.

- Climbs
  Hills and stairwells are the primary options. When using higher intensity effort (stairwells, short hills), go hard for up to 30-seconds, then rest for twice the length of the work. More moderate intensity efforts (longer hills) can last up to three minutes, followed by rest of an equal duration

- Level Terrain
  On level terrain, the increased power demand must come from a heavier pack or faster movement. As mentioned above, the expected mission requirements will dictate pack weight. Work to rest ratios will vary depending on the intensity of the effort. Short, explosive movements such as 3-5 second rushes will require rests periods of at least 2-3X the duration of the rush. Consider using tires, logs, stakes/engineering tape, etc, to set up agility challenges.

- Mixed Terrain
  The principles of Fartlek and Terrain runs can be used for an effective power ruck session. As with Fartlek runs, leaders must be in tune with their men's stamina and adjust the speed/load accordingly. Moving back and forth from roads, trails, sand, and grassy fields challenges the body's stabilizers. Seek out rolling terrain to further challenge the stabilizing demand. Save the more challenging mixed-terrain power rucks for phase two and three.

8. Swimming

Purpose: Primarily used as an aerobic workout that provides relative rest for the weight-bearing bones/joints. The principles of interval training can also be

applied to swimming or deep-water running (best with an aqua jogger belt) to create an anaerobic workout with little joint stress.

Utilization: Because of the non weight-bearing nature of swimming, it can be performed frequently and is a good choice for a second workout of the day. Leaders should consider swimming as the primary workout of the day on those occasions when the legs need recovery from the previous day's workout or during recovery weeks.

Execution: For aerobic conditioning, swim at a steady pace for 20-60 minutes. For inefficient swimmers that fatigue easily, a combination of swimming and deep-water running with a flotation vest is a good option. For anaerobic conditioning, there are many variations on interval training for runners that can be applied to the pool.

Running Form

Most discussions of how to improve running center around various workouts designed to improve speed. Often overlooked, however, is the efficiency of running form. Since running form among elite runners can vary significantly, there is a tendency to let the individual find a gait to their liking and leave it alone. Indeed, running is a very fluid, natural act that may be inhibited by over-analysis. However, there are several things runners can do to improve their efficiency without overhauling their natural style. Most runners will find one or two points on which they can improve.

- Head: The head should remain over its base of support – the neck, with the chin neither pointing up or down. Allowing the head to ride forward puts undue strain on the muscles of the upper back.
- Shoulders: The shoulders should assume a neutral posture – neither rounded forward nor forcefully arched backward. Rounding the shoulders forward is the most common fault in everyday posture as well as with running. This is usually associated with tightness of the chest and shoulders. Another problem occurs when the shoulder girdle starts to rise with fatigue or increased effort. This position not only wastes energy, but can also adversely affect breathing.
- Arms: Throughout the arm swing, the elbows should stay at roughly a 90-degree bend. The wrists stay straight and the hands remain loosely cupped. The arm swing should be free of tension, but do not allow the hands to cross the midline of the body.
- Trunk and Pelvis: Like the head, the trunk should remain over its base of support – the pelvis. A common problem with fatigue is allowing the trunk to get in front of the legs and pelvis. This forces the lower back muscles to spend too much energy resisting further trunk collapse to the front.
- Legs: For distance running, much of the power comes from below the knee. Energy is wasted as the knees come higher and the big muscles around the hips and thighs get involved. Practice getting a strong push-off at the ankle joint. This helps to naturally lengthen the stride. Lengthening the stride by reaching forward with the front leg will be counterproductive.
- Feet: For most Rangers, the feet should be pointing directly forward while running. With fatigue, flat feet, and certain muscle imbalances, the legs and feet will start to rotate outward. This hinders performance and may create abnormal stresses that cause injury.

Principles of Movement Skills Training

BOTTOM LINE UP FRONT – RAW BULLETS FOR MOVEMENT SKILLS:

- Take time to learn the correct movement. When teaching, do the same. This means planning PT sessions to allow sufficient teaching time. You will have to sacrifice a conditioning effect on those days you teach new drills, but your men will be better in the long run.
- You need to be fresh to master complex movements. Don't smoke your guys and then expect them to do well with agility/power drills or with obstacles.
- Within a given PT session, it's best to place movement skills training right after movement prep. If the schedule dictates agility/power drills after other activities, the men will be somewhat fatigued. In such cases, the squad leader should take a little extra time before beginning agility/power drills and avoid pushing the intensity/duration of the session too hard.

Methodology for RAW Movement Skills Training

Movement skills are what link your strength and endurance to the actual physical task at hand. For example, negotiating obstacles requires not only strength and endurance, but movement skills that make execution of each obstacle safe and efficient.

Movement skills can be grouped into three broad categories: agility, balance, coordination (ABCs). Agility is the ability to change direction, balance is maintaining your center of gravity in an effective position relative to your base of support, and coordination is the ability to effectively do more than one thing at a time. These skills are best developed in childhood, but improvements can be made through training at any age.

In the strength section, we talked about the type of strength Ranger needs. For effective movement skill, strength means control of forces acting on the body. Muscles work either to move or prevent movement at the joints around which they live. Most often we focus on the movement that muscles create because that is what is most apparent. Less obvious though is the "braking" force that muscles apply to joint movement. Without this braking effect, nearly all movement would be extremely sloppy and potentially dangerous.

Around the body's core, this braking action of the trunk muscles becomes extremely important for a couple reasons. First, the spine and pelvis, the base of attachment for many muscles that power the arms and legs. Secondly, the body's center of gravity is within the core area. Keeping it there leads to balanced, skillful movement. This is the job of the core muscles and they do it primarily by putting on the brakes.

For example, in agility training we create drills where momentum is taking the body in one direction, but the task requires change of direction. This requires a level of braking strength, but it also requires awareness of body position. This is very evident during cutting movements. To turn a corner effectively, not only do you need braking strength to slow down your momentum, but you also need an effective movement strategy. Generally, this means lowering the body, planting on the outside leg, and preventing the ankle and knee from rolling outward. You can be strong as an ox, but if your ankle and knee roll to the outside every time you try to cut, you won't be very effective.

These movement strategies must eventually become subconscious. Think of them as your default settings. If your default settings aren't appropriate, your movement will be inefficient. Some degree of conscious awareness of the correct movement, combined with repetitive, controlled drills will usually help. Such drills develop muscle memory, with the goal that the movement quickly becomes automatic – your default setting.

Execution of RAW Movement Skills Training

1. 360-Core

Purpose: Promote core stability and endurance in all planes.

Utilization: This drill should be performed 2-3 times per week in all phases. Development of core stability is a critical component of the RAW program. In Phase 1, the emphasis is on mastering the correct positions and movements, not creating a smoke session. Sloppy execution likely does more harm than good. Once the men have demonstrated solid technique, the advanced techniques can be added and duration of the drill progressed. Per the Physical Training Menu, the Ring of Fire or Med Ball Drills may be substituted for the 360-Core, or two drills may be combined. However, combining drills is best saved for **Phase 2** and beyond.

Execution:

This drill is performed on the ground, alternating between exercises that work the front, back, and sides of the core. Minimize or eliminate rest between exercises by moving directly to the next position, keeping the core muscles engaged throughout. The plank and bridging exercises are best performed for hold time as opposed to repetitions. Rather than hold for maximum duration, it is best to hold 10-30 seconds, then smoothly transition to the next position. The other exercises can be performed for reps or time.

Front Side Emphasis

Plank (Progress to 3-point then 2-point diagonal support)
PU+ with Left and Right Arcs
Supine Bicycle
Double Crunch

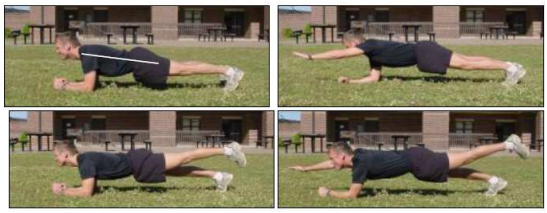
R/L Side Emphasis
Side-Bridge (Progress to alternating single leg support)

Back Side Emphasis
Supine Bridge (left leg support)
Supine Bridge (right leg support)
Reverse Plank (Progress to 3-point support)
Prone Row

360-Core

Though recommended hold times are given for these exercises, the most important factor is form. So, before fatigue causes form to break, move to the next exercise in the sequence.

Plank



- Maintain rigid alignment of the trunk and legs while supported on the forearms and toes.
- Advance to 3-point support (lift an arm or leg) only if perfect form can be maintained for several 20-second sets.
- Advance to 2-point support (lift opposite arm and leg) only if perfect 3-point support can be maintained for several 20-second sets.
- Look down to keep the head aligned with the trunk…and breathe.

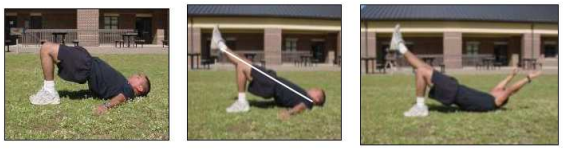
Side Bridge

- Support body weight with the forearm and stacked legs, then raise the hips to bring the body into straight alignment.
- Attempt to hold rigidly for 20 seconds. Alternately, perform slow, controlled repetitions for 20 seconds.
- Advanced techniques include bottom or top leg support only. The drill can also be performed with the bottom elbow (right in pictures above) extended and the hand on the ground.

Supine Bicycle

- Perform 1 set for 1 minute.
- Perform at a slow pace without jerking on the neck.
- Attempt to touch the elbow to the opposite knee.
- Reach as far as possible with the straight leg and lower it slowly to within a few inches of the ground.
- Do not allow the low back to arch off the ground.

Supine Bridge



- Raise the hips, supported by the upper back and feet.
- Keep the head off the ground with the chin tucked
- Lift one leg and straighten at the knee. Keep the leg aligned with the trunk. Do not let the pelvis sag down on the side that side.
- Hold 5 seconds, then switch legs without lower the hips. As long as form remains perfect, continue to alternate legs.
- Advanced techniques include arms overhead and/or heels starting farther from the body.

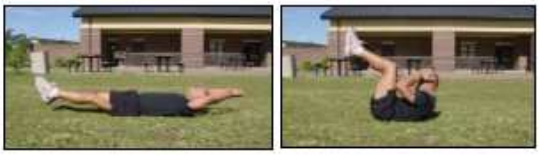
PU+ with LEFT and RIGHT ARC

- Begin in the front-leaning-rest position. Perform the push-up plus by pressing with the shoulder blades to raise the chest higher off the ground. Maintain this position throughout the exercise.
- Keeping the feet in place, slowly "walk" with the hands in an arc to the left, return to the middle, then repeat to the right.

Reverse Plank

- Support body weight with the arms and feet while maintaining rigid alignment of the trunk and legs. Keep the core muscle tight throughout.
- Don't hyperextend the elbows.
- Attempt to hold for 20 seconds
- Advance to the 3-point position (picture on the right) by flexing the support leg to 90 degrees and lifting the other leg to bring it in line with the trunk.

Double Crunch



- Perform at a slow pace.
- Attempt to touch the elbows to the knees with the feet off the ground, then maximally extend the body by reaching with the arms and legs.
- Lower the arms and legs to within a few inches of the ground, but do not allow the low back to arch off the ground.

Prone Row

- Begin with the arms overhead a few inches off the ground and the head in line with the rest of the body.
- Slowly lift the head and chest and perform a rowing motion with the arms, keeping the forearms parallel to the ground. The shoulder blades should pinch together. Hold 2-4 seconds and repeat.
- Lifting the legs may excessively increase pressure on the lower spine and is not recommended.

2. Elastic Band Resistance (including Ring of Fire)

Purpose: Promote core stability and endurance in standing. The drill engages the lower extremity and core muscle while demanding teamwork (if performing Ring of Fire) and attention to detail.

Utilization: Generally 1-2X per week in all phases. In **Phase 1**, the emphasis is on mastering the correct positions and movements, not creating a smoke session. Sloppy execution likely does more harm than good. Once the men have demonstrated solid technique, the advanced techniques can be added and duration of the drill progressed. In **Phases2 and 3**, the drill may be performed in kit. Per the Physical Training Menu, the 360-Core or Med Ball Drills may be substituted for the Ring of Fire, or two drills may be combined. However, combining drills is best saved for **Phase 2** and beyond.

Execution: For the Ring of Fire method, there are 8-20 Rangers per ring, with each pair directly opposite one another around the ring. All commands come from the squad/ring leader. Attempt to keep the ring centered at all times. Perform each exercise for 1 minute. For example, perform one minute of the Side-Step Squat to the left and one minute to the right. Several repetitions of each exercise can be performed within one minute. Maintain the end position (most tension in the band) for 3-5 seconds. Always maintain body control. For most drills, this means maintaining the power stance.

Alternate Execution: This workout can also be performed individually or in pairs by separating the elastic bands from the ring and anchoring to any permanent structure.

Safety Note: For the side-step and other lateral movements, always pivot back toward the middle before stepping toward the middle to avoid twisting the knee and ankle.

Basic Movements

Side-Step Squat Left/Right
Backward Walk to Squat
Walking Lunge Away from Circle
Bear Walk
Backward Walk with Side-Step (½ circle in each direction)
Lateral Lunge and Twist L/R (Using Arms)
Backward Walk to Squat and Row (Using arms, first set straight row, second set hand over hand)

Phase 2 Additions
Backward Walk to Single-Leg Support
Forward Walk to Single-Leg Support

Elastic Band Resistance

These exercises may be performed by up to 20 Rangers around a central attachment (Ring of Fire) or by individuals as shown. The commands described under each picture pertain to execution in a group, so that all movements are coordinated.

Side-Step Squat Left/Right

- On the command, "Ready," move into the power stance, facing L or R.
- On the command, "Move," start side stepping away from the ring. Each Ranger coordinates their movement with the group, keeping the ring centered.
- On the command, "Hold," stop moving the feet, squat lower, and hold until the next command.
- On the command, "Recover," rise out of the squat and at the same time pivot toward the ring. Slowly walk back toward the ring, but do not allow the ring to touch the ground.

Backward Walk to Squat

- On the command, "Ready," move into the power stance, facing the ring.
- On the command, "Move," back-peddling away from the ring. Each Ranger coordinates their movement with the group, keeping the ring centered.
- On the command, "Hold," stop moving the feet, squat lower, and hold until the next command.
- On the command, "Recover," rise out of the squat and slowly walk back toward the ring. Do not allow the ring to touch the ground.

Walking Lunge Away from Circle

- On the command, "Ready," move into the power stance crouch, facing away from the ring.
- On the command, "Move," begin taking lunge steps away from the ring. Each Ranger coordinates their movement with the group, keeping the ring centered.
- On the command, "Hold," stop stepping, lower into a full lunge, and hold until the next command.
- On the command, "Recover," rise slowly out of the lunge and return toward the ring taking controlled rear lunge steps. Do not allow the ring to touch the ground.

Bear Walk

- On the command, "Ready," move into the mountain climber position, facing away from the ring.
- On the command, "Move," begin bear walk steps away from the ring. Each Ranger coordinates their movement with the group, keeping the ring centered.
- On the command, "Hold," stop moving and hold that position until the next command.
- On the command, "Recover," *remain on all fours* and slowly bear walk in reverse back toward the ring. Do not allow the ring to touch the ground. Do not stand up while there is still tension in the band – you may become a projectile.

Backward Walk with Side-Step

- Begin as per the Backward Walk to Squat. Once holding in that position, the next command is, "Move Left."
- Begin taking side-steps to the left. Maintain full tension in the band.
- On the command, "Hold," stop moving the feet, squat lower, and hold until the next command.
- On the command, "Move Right," begin taking side-steps to the right.
- On the command, "Hold," stop moving the feet, squat lower, and hold until the, "Recover," command.

Lateral Lunge and Twist L/R

- Face left or right, with some slack in the band.
- On the command, "Ready," grab the band with a two-hand grip.
- On the command, "Pull," pull the band across the body while taking a lunge step away from the ring. (No hold command needed.)
- On the command, "Recover," return to the starting position.
- Repeat the "Pull/Recover" for 8-10 reps, then switch directions.

Backward Walk to Squat and Row

- First, perform the Backward Walk to Squat per the previous guidance.
- Next, use the "Pull/Recover" commands to perform 8-10 reps of the row (shown above)

Backward Walk to Squat and Row

- First, perform the Backward Walk to Squat per the previous guidance.
- Next, use the "Pull/Recover" commands to perform 8-10 reps of the row using the hand-over-hand technique shown above

MedBall Drills (Core Stability Emphasis)

Purpose: Develop core stability for both short and long-range explosive movements; provides resistance to movement in all planes.

Utilization: Once or twice per week in all phases. The session lasts 20 minutes.

Execution: A solid wall is needed for this drill. Perform the drill in groups of two or three, using a 1:2 work-to-rest ratio in the early part of **Phase 1**. With one partner working and the other(s) monitoring form, perform the short and medium-range wall-based exercises for 20 seconds, then switch (40 seconds rest). Progress to 30-second sets in **Phase 2**, using a 1:1 work-to-rest ratio. In **late Phase 2**, the rest time can be reduced. Perform short-range drills in order (2 sets) before the medium-range drills. The short-range drill is meant to be performed at maximal intensity. The first couple throws are used to get the rhythm, but then it is balls to the wall intensity.

For the partner, medium-range drills, the intensity should be reduced and each exercise maintained for 1 minute. Rest briefly (about 10 seconds) before the next exercise in the drill.

Ensure core stability throughout the work phase. If fatigue causes improper technique, stop no matter the time on the clock. Choose a medball weight that allows completion of the drill.

Short-Range (against wall, 2 sets)
- Chest Toss
- Overhead Toss
- Overhead Toss Staggered-Stance Left
- Overhead Toss Staggered-Stance Right
- Rotation Toss Left
- Rotation Toss Right

Medium-Range (against wall, 1 set)
- Chest Toss
- Rotational Toss Left
- Rotational Toss Right

Partner, Medium-Range (1 min each)
- Underhand Toss
- Rotational Toss L
- Rotation Toss R

Optional Substitutions (Phase 2/3)
- Underhand Diagonal (wall)
- Backward Over-the-Shoulder (wall)

MedBall Drills

Short-Range and Medium Range
As the movements are being mastered, ensure adequate rests between sets. Later, the Tabata Interval method (20s explosive work, 10s rest, repeated x8) can be used very effectively with these exercises.

Chest Toss Short-Range

- Remain in the power stance with core muscles tight throughout the drill.
- Bounce the ball vigorously off the wall and catch at chest height with the ball just a few inches away from the chest.
- The first couple throws are relatively slow to ensure proper technique, then go rapid fire with good form.

Overhead Toss Short-Range

- Keep the core muscles tight throughout the drill. This will prevent the back from arching.
- Bounce the ball vigorously off the wall and catch in the overhead position with the elbows bent.
- The first couple throws are relatively slow to ensure proper technique, then go rapid fire with good form.

Overhead Toss Staggered L/R Short-Range

- This drill is the same as the Overhead Toss, except the stance is staggered. Either switch left and right during a set or perform an equal number of left and right sets. Keep the core muscles tight throughout the drill. This will prevent the back from arching.
- Bounce the ball vigorously off the wall and catch in the overhead position with the elbows slightly bent.
- The first couple throws are relatively slow to ensure proper technique, then go rapid fire with good form.

Rotation Toss L/R Short-Range

- Remain in the power stance with core muscles tight throughout the drill.
- Use a scooping motion of the arms to throw the ball vigorously off the wall. The arms perform most of the work, with the trunk rotating slightly with each toss.
- Do not let the ball rebound beyond the point shown in the picture.
- The first couple throws are relatively slow to ensure proper technique, then go rapid fire with good form.

Chest Toss Medium-Range

- This drill is similar to the Short-Range Chest Toss, but involves a larger movement.
- Stand 5-7 feet from the wall, crouch into the power stance with the ball at the chest, then explode out of that stance to throw the ball.
- Throw the ball hard enough so that it hits the wall at about head level.
- The ball should be caught at chest level, with the body back in the power stance.
- Although the legs flex and extend, the feet should remain in place.
- Emphasis is on explosive/powerful movement and maintaining good form

Rotation Toss L/R Medium-Range

- This drill is similar to the Short-Range Rotation Toss, but involves a larger movement.
- Stand 5-7 feet from the wall in the power stance with the ball held outside the leg farthest from the wall. Most of the body weight should be on the outside leg. Rise explosively out of the power stance and whip the ball to the wall, transferring weight to the inside leg.
- Throw the ball hard enough that it hits the wall at about shoulder height and returns.
- The catch should end back in the starting position.

3. Speed/Agility/Coordination Drills

The purpose of this drill is to optimize movement skills and improve reaction, speed, and change-of-direction.

A. Speed/Quickness Drills

Always perform the speed prep drill first: 1 rep over a 10-20M segment.
For the speed/quickness drill, perform 2 or 3 progressive repetitions (don't start out at 100%). The distance for each repetition should be about 20-40 yards. Walk slowly back to the start point. This should not be a highly fatiguing drill in **Phase 1**, when the work-to-rest ratio should be about 1:5. In **Phase 2**, the rest time can be decreased, though form should never be compromised during these drills. Attempting to sprint through fatigue will only promote injury. Do not race – instead concentrate on form.

Performance Note: For the Athletic Stance Lateral Sprint, the first movement consists of simultaneously bringing the lead leg back under the body's center of gravity (rather than stepping) and pivoting the trail leg to line up the body in the direction of travel.

Speed Prep
Butt-Kick Walk
High-Knee Walk
Butt Kick Jog
Walking Forward Leg Kicks (Ballistic Hamstring Stretch)
Verticals

Speed/Quickness Drill
Verticals to Sprint
Forward Falls to Sprint (with partner, without, then partner breakaways)*
Mountain Climber to Sprint
Athletic Stance to Lateral Sprint (10 meters only)

*Forward Falls are a foundational drill best used in **Phase 1**. In **Phase 2**, use only the partner breakaways.

Agility/Coordination Drills

It is best to begin with the speed skater, which is performed in place. The next two preliminary drills should begin at a modest intensity (the "sprint" should be a 70-80% effort). The other drills are performed to the distances indicated. As with all skill training drills, group leaders

should observe for sloppy movement due to fatigue or lack of concentration. Especially in **Phase 1**, emphasis should be on correct execution, not creating a smoke session. Also be aware of field conditions and adjust speed of movement as necessary to avoid slips and falls.

The drills can be used to create a circuit, spending about 2 minutes each at the ladder, cones and low hurdle stations, with a fourth station chosen from among the other drills listed below.

Preliminary Drills
Speed Skater (8-10 progressive reps in each direction as an agility prep)
Laterals to Run (10-20 yards of laterals then 10-20 yard sprint)
Crossover to Run (10-20 yards of crossovers, then 10-20 yard sprint)
Run and Reach (20-40 yards moving forward; reaching every third step)

Agility Ladder
Forward Shuffle (May substitute forward run - each foot in each square)
Lateral Shuffle

Cones (8-10 cones, 3 ft apart)
Forward Shuffle
Lateral Shuffle (stagger the cones)

Low Hurdles (8-10 hurdles, 2-3 ft apart)
Lateral Step-Over
Forward High Step

Cuts – (4 cones or other markers placed 10 yards apart)
45-degree cuts
90-Degree Cuts
Triangles (10 yards apart; alternate R/L direction)

Other Agility Options
Lateral Shuffle Reaction Drill (performed on the squad leader's command over a 5-15 meter area in each direction (do not pause when changing direction)
Drop Step Shuffle (40-yard length; change direction every 5 yards)
3-5 second rushes
T-Drill (10 yards for each segment of the "T")
Illinois Agility Test

Speed and Agility

In addition to the drills shown below, there are many other potential options. Master the basics shown here, then seek out other agility drills that make sense given your tactical experience. For instance, logs, tires, stakes/ropes, etc can be lain out over natural terrain (ditches, slopes) to create a realistic agility course.

BUTT-KICK WALK/JOG

- Begin at walking speed
- Fire the hamstrings to lift the heel quickly to the butt.
- Do not let the knee go forward of the trunk.
- When the left leg is on the ground, the right arm is forward.
- After a few kicks with each leg, break into an easy-pace jog using the same technique.
- Perform over a 20-30 yard segment.

HIGH-KNEE WALK

- This drill combines the butt-kick walk with a high step. It improves running efficiency, especially for sprints.
- Immediately after performing the butt-kick, lift the knee quickly to the front to hip level.
- Use strong arm action as shown in the pictures.
- Perform over a 20-30 yard segment.

WALKING FORWARD LEG KICKS (Ballistic Hamstring Stretch)

- This drill is similar to the high knee walk, but adds a quick kick to straighten the leg and stretch the hamstring.
- Maintain a tall stance. Do not lean forward at the trunk.
- Keep the intensity and range of motion relatively low for the first few kicks, then gradually kick faster and farther.
- The height of the kick will vary greatly among the men due to difference in hamstring length. Do not attempt to have everyone kick to the same height.
- Perform over a 10-20 yard segment.

Verticals to Sprint

- Perform verticals as per the movement prep guidance.
- At the 10 yard mark, transition into a sprint by leaning the entire body forward over the next few strides. Do not bend forward at the waist to transition to a sprint. Continue to use strong arm action and a tall stance once you hit the sprint stride.

Forward Falls (w/ Partner)

- Begin with partner falls. The "sprinter" rises onto the toes, then lets the body fall forward while keeping straight alignment from head to toe. The partner catches the sprinter at the collar bone and upper chest as the sprinter performs one very quick but short first step. The sprinter's arms fire quickly into the sprint ready position. Perform 3-4 reps on each leg. The two keys to this drill are 1) letting the straight body fall forward maximally before stepping, and 2) ensuring that the first step is not so long that the foot gets forward of the body's center of gravity.
- Forward Falls are a foundational drill best used in **Phase 1.** In **Phase 2**, use only the partner breakaways.

Forward Fall to Sprint

- Next perform 3-4 forward falls unassisted. Without a partner to catch you, fire out into a 15-20 yard sprint. Do not pause after the first step, but rather use the forward momentum of the body to "roll" into a sprint.

Partner Breakaways

- Perform forward fall with partner as previously described, except add resisted sprint and breakaways.
- The partner provides moderate resistance to the sprinter while back-pedaling. At about 5-10 yards, The partner turns and releases to sprint along side the sprinter.
- Forward Falls are a foundational drill best used in **Phase 1**.
- In later phases, use only the partner breakaways.

Mountain Climber Sprint

- On the fourth count of the mountain climber exercise, push vigorously from the arms and legs to rise into a sprint.
- Do not pause before rising, but rather use the spring effect of the mountain climber rep to move quickly into the sprint.
- Alternate which leg is forward to begin the exercise, performing an equal number on each leg.

Athletic Stance to Lateral Sprint

- Start in the athletic/power stance. Let the body drop slightly as you take weight off the legs and perform a pivot in the direction of the lateral sprint.
- The foot of the lead leg should not step out in the direction of the sprint, but should actually be pulled slightly back under the body. This allows the body's center of gravity to get in front of the base of support (lead foot), which in turn gets your momentum going in the direction of the sprint.
- Use strong arm action. During the initial movement, the trailing arm powerfully drives across the body in the direction of the sprint.
- Perform and equal number of sprints in each direction.

Speed Skater

- First step side to side, then add the hop as shown in the middle picture.
- Do not allow momentum to force the knee outside of the foot.
- Do not allow the foot/ankle to roll to the outside – keep the inner edge of the foot firmly in contact with the ground.
- Perform 8-10 progressive reps in each direction as an agility prep.

Laterals to Run

- Perform 10-20 yards of laterals per the movement prep guidance, then turn and sprint 10-20 yards.
- The lead foot may be turned in the direction of travel or kept parallel to the other foot.
- Perform an equal number of reps in each direction.

Crossover to Run

- Perform 10-20 yards of crossovers per the movement prep guidance, then turn and sprint 10-20 yards.
- Perform an equal number of reps in each direction.

Run and Reach

- Perform over 20-40 yards, jogging forward and reaching down and to the outside of the forward leg every third step.
- The first few reps are performed at a modest intensity and range of motion. Gradually increase the speed and range of motion.

Forward Shuffle (Agility Ladder)

- Crouch with the right foot in the first square. Rise out of the crouch and take a shuffle step to the right, so that the left foot is now in the first square.
- Quickly step forward with the left foot into the second square.
- Rise out of the crouch and take a shuffle step to the left, so that the right foot is now in the second square.
- Quickly step forward with the right foot into the third square (not shown), and continue down the ladder.

Lateral Shuffle (Agility Ladder)

- Step into the second square with the trail foot (right foot in picture), then the second square with the lead (left) foot.
- Step out with the trail foot first, then the lead foot. When stepping out with the trail foot, place it behind the third square rather than directly behind the second square.
- Step into square three with the trail foot, then square four with the trail foot. Continue down the ladder
- Cadence should be "in, in, out, out" with the lead foot touching in every "even numbered" square and the trail foot in every "odd numbered " square
- Perform an equal number of reps in both directions.

Forward Shuffle (Cones)

- Running forward through cones spaced about 1 yard apart, plant on the outside leg with plenty of bend in the hip and knee.
- Take a shuffle step between cones, again planting on the outside leg and crouching low.
- Do not allow momentum to force the knee outside of the foot.

Lateral Shuffle (Cones)

- Stagger the cones and move laterally around the cones, keeping the feet and body directed forward.
- Take short stride, stay in a crouch and control forward/rearward momentum.
- Repeat an equal number of reps in both directions.

Lateral Step-Over (Low Hurdles)

- Stay on the toes and use strong arm action to move over the hurdles.
- Each foot should touch down between each set of hurdles.
- Repeat an equal number of reps in both directions.

Forward High Step (Low Hurdles)

- Stay on the toes and use strong arm action to move over the hurdles.
- Each foot should touch down between each set of hurdles.

Cuts/3-5 Second Rushes

- Space the cones to allow for 3-5 second rushes. Place the cones to allow 45-90 degree cuts
- Sprint to the first cone and do one of the following:
  - Plant and cut to the next cone, ensuring that the outside knee does not drift to the outside of the base of support.
  - Take a knee, pause, then move out to the next cone
  - Go to the prone position, pause, then move out to the next cone.

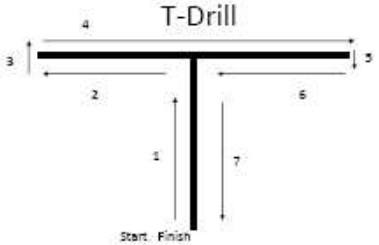
Lateral Step Reaction Drill

- This drill proceeds on the command of the squad leader.
- Include an equal amount of left and right movement. Vary the length of each segment to keep the men guessing as to when the next change of direction will occur.
- Get low at the point of change of direction. Do not allow the foot/ankle to roll to the outside – keep the inner edge of the foot firmly in contact with the ground.
- Do not allow momentum to force the knee outside of the foot.

Drop-Step Shuffle

- Angle the body 45 degrees to the right while looking forward.
- Take shuffle steps to the right at a 45 degree angle to the rear.
- After 5 yards, take a quick hop and spin the body around to land in the mirror image position.
- Continue shuffling and changing direction with the hop/spin method for about 40 yards.
- Do not plant and twist the leg to change direction.
- A partner can be used to act as an "offensive player" (running forward and cutting), while the other RGR reacts to the cuts with the drop step shuffles.

T-Drill



1. Run forward.
2. Crouch and side-step (laterals) to the left.
3. Step forward to move to the other side of the top of the T.
4. Stay in a crouch and side-step to the right.
5. Step backwards to move to the inside of the T.
6. Crouch and side-step (laterals) to the left.
7. Run backwards through the finish line.

Hybrid Drills

1. **Tabata Intervals (Described previously in the Strength chapter)**

2. **Stamina Drill**: Stamina can be defined as the capability of sustaining long, stressful effort. It also means staying power.

Purpose: Challenge multiple energy pathways, local muscle endurance, and willingness to fight through fatigue – this is meant to be an exhaustive drill.

Utilization: Due to the overall intensity of the drill, Rangers must first establish a moderate to high level of endurance and mastery of the component tasks (PU, pull-ups, lunges, etc) before performing the sequence listed below. If using the phased approach, it is best saved for **Phase 2**.

Execution: The order shown below (2-10) represents a basic sequence that can be used for any number of drills with a similar intent. Alternating upper body, lower body, core, and anaerobic running keeps the cardio-respiratory demand high without exhausting any one movement pattern. For variety or preference, one or more of the upper body, lower body, and core sequences can be replaced by combined movements such max-height med ball throws, kettle-bell exercises, tire-flips, etc.

1. Run 8-10 minutes at an easy-moderate pace
2. Alternating sets of push-ups and pull-ups/chin-ups/heel claps: 3 sets each; perform as many perfect repetitions as you can, then switch from pushing to pulling and vice versa; take only 10-20 seconds between sets.
3. Lunge Drill: 2 sets of 20 reps on each leg. Within a given set, perform a variety of lunges (forward, rear, diagonal, side, or transitional lunges)
4. Core Work: One to two minutes using a variety of core exercises (medball slams/wall tosses, 360-core, sit-ups).
5. 300-yard shuttle at a challenging pace (80% effort). Take a two-minute walking recovery (hydrate), then repeat.
6. Repeat PU, pull-up/chin-up/heel clap sets x2
7. Repeat Lunge Drill (15 reps each leg)
8. Repeat Core Work
9. Repeat 300-yard shuttle
10. Repeat the muscular endurance drills (PU, pull-ups/chin-ups/heel claps, lunges, core) x1.
11. Run 8-10 minutes at an easy-moderate pace.

3. MedBall Relays

Purpose: Develop total-body power, agility, and coordination while challenging anaerobic endurance.

Utilization: Rangers must first establish a moderate to high level of endurance and mastery of the component tasks (ex. agility training, med ball throws). These drills are best saved for Phase 2 and beyond.

Execution: See individual drills below:

One-Bounce MedBall Drill
Perform this drill over a large, flat field of about 100-yard length. One Ranger performs a maximal medicine ball (3 or 4kg) throw (backward/overhead), then races forward past his partner to prepare to receive the partner's throw. The partner races ahead to catch the ball on one bounce, then performs the throw. One partner must catch the MedBall past the 100-yard line and both partners must run to the line. After one catch past the 100-yard line, immediately return in the opposite direction. Attempt to catch the ball from the power stance – do not let momentum from running carry you more than one step past the point where the ball is caught. If the ball is dropped or takes more than one bounce, both partners are penalized (squad leader discretion - 10 seconds added at end or 10 pushups where the ball was dropped).

Suicide Relays
Carry the MedBall while performing suicides over 5, 10, and 20 yards (same course as Partner Shuttle Drill). Touch the MedBall to each line. End the 20-yard segment by running through the Start/Finish line, while handing the ball to the partner. Perform 5 reps, then rest 3-5 minutes and repeat.

Sand Pit Relays
For this variation, start at one end of a sand pit (size of a beach volleyball court). Run to the other end and back (ducking under the net if one is in place), handing the MedBall off to the partner. Perform 5-10 reps then rest and repeat.

4. Partner Shuttle

Purpose: Develop local muscle endurance through calisthenics while challenging anaerobic endurance.

Utilization: May be used in all phases as a time-efficient, field-expedient method for training both strength and endurance. It works well as one of three events on days when the Ground Base circuit is performed by the company.

Execution: One partner runs the shuttle course (down and back over 10, 20, and 30-meter segments) while the other performs calisthenics (PU, SU, supine bicycle, pull-ups, etc.) from the muscular endurance session. If fatigue precludes good form, discontinue calisthenics and begin walking for recovery between shuttle runs. This activity is meant to be performed at high level of intensity. Length of the session is variable based on fitness and the other PT events preceding or following. Generally we start with 6-8 minutes and progress over the phases to longer sessions and/or the addition of kit.

Tactical PT

Effective physical training optimizes the ability to meet tactical physical requirements. In nearly all instances, these requirements demand a mix of movement skills, strength, and endurance. Rangers should establish good movement skills and a moderate to high level of strength and endurance before attempting O-courses and other very demanding tactical PT activities. Tactical PT events may be used throughout the training cycle, however, they are best used in Phases 2 and 3 due to their higher physical demand and risk for injury.

Some recommended activities are:

- Traditional Obstacle Courses (various lengths and configurations)
- Combatives
- Casualty Evacuation Carries/Pulls
- Power Ruck
- Combination of the above. For example, lay out a course over several miles of varied terrain. Load and distance depend on progression within the training cycle (see below). Place stations 1-2 km apart and include tire flips, litter carries, skedco pulls, sprints, etc.

Avoid overemphasis on any one mode of tactical training. Instead plan out your phased training schedule, to include all events at the appropriate time in the training cycle. See the guidance below to determine the best use of each drill. In addition to these drills, leaders should gradually incorporate other training events in ACUs/Boots/Kit per the phased guidance below.

The recommended incorporation by phase is as follows:

- **Phase 1**: The primary purpose of phase one is to lay the foundation for better performance in the later phases. *The first session of each tactical drill should be primarily instructional in nature.*
    - Obstacle Courses: Instructional only (exception: command directed assessments such as the RPAT).
    - Combatives: No restrictions
    - Casualty Evacuation Carries/Pulls: Best saved for Phases 2 and 3
    - Power Ruck: May begin in this phase. As with the distance running program, leaders should plan a systematic progression of the duration and intensity over the three phases.
- **Phase 2**: In addition to the tactical drills, begin performing other RAW events in ACU/Boots once or twice per week (do not perform the primary runs in boots). After four weeks in this phase, add the RBA/MICH as you see fit.

- Obstacle Courses: First, master standard obstacles in ACUs/Boots, then add RBA/MICH if it adds value and does not overly increase fall/injury risk.
- Combatives: No restrictions
- Casualty evacuation carries/pulls: Master standard carries in ACUs/Boots, then add RBA/MICH and gradually increase training intensity.
- Power Ruck: Progress duration/intensity systematically

- **Phase 3**: In addition to the phase two guidance, perform the RPAT and/or command-directed assessments.

PT Scheduling Guidance

There are many ways to schedule PT over a training/deployment cycle, but all should be developed in accordance with the principles of exercise. Initially for RAW, the phased approach described below was developed with those principles in mind. However, feedback from the battalions has identified some limitations with a pure application of the phased approach. The most commonly cited issue is the fact that the battalion training cycle often precludes consistent PT during RAW Phase II – precisely when the most important progression of training is recommended.

While we still believe the phased model and six-day rotating schedule have value, it is not the only way to vary the physical stress over a given period of time. (For an alternative means of scheduling PT, see "An Option to Phased Scheduling" below.) It is certainly feasible for leaders to apply a phased approach to a different set of timetables. For example, some Rangers have suggested deployment as a time when the most challenging strength/power workouts should be scheduled, since there is usually consistent and prolonged gym time. Under such a plan, sustainment, or even further strength development, could be maintained during what is now Phase 1. Then when the operational training cycle picks up (Phase II), these Rangers would then get their relative rest (decreased training volume) from the rigors of strength training…in effect, their recovery period.

Traditional Phased Approach to PT Scheduling*

Phase I – Transition: In the current operational cycle, this phase begins upon return from deployment and ends after four weeks of PT (block leave, etc. does not count). The emphasis is on recovery from deployment. Rangers should get therapy for any nagging injuries that linger from deployment. The physical training stress is relatively light during this phase. Squad leaders should use this phase to make sure their men achieve mastery of all the drills. The Functional Movement Screen (FMS) is best conducted during this phase. Initial performance tests may be performed during this phase and repeated in phase three.

Phase II – Foundation: This phase begins immediately after the first phase and runs for about 14 weeks. Leaders should gradually demand more of their men during this phase. More demanding workouts are added as this phase progresses on the assumption that Phase 1 and early Phase 2 laid a good foundation of core strength, movement skills, and endurance. The athletic assessments should be repeated toward the end of this phase.

Phase III – Assessment and Validation: This phase links the second phase and deployment. It will generally be about 3-4 weeks in length. During this time, leaders must ensure their men are ready for deployment. The RPAT and other performance

tests should be done during this phase. While training should be tough and realistic, leaders must also take steps to reduce the risk of injury or overtraining.

Phase IV – Sustainment: In the current operational cycle, this is the deployed phase. While on deployment, the goal is to maintain peak physical performance without compromising mission readiness (for example, an exhaustive workout performed before a physically demanding mission). Depending on the location of deployment and the missions, Rangers might be able to use this phase as an opportunity to develop either general strength through gym-based resistance training, or power/power endurance using training modes described in that section of this manual.

*Read throughout the main text of this section for alternatives to this approach.

The 6-Day Rotating Schedule (see the table below) was designed to accompany the phased approach to training. The rotating schedule allows a battalion to assign the gym to one company per day.

Six days were chosen for several reasons: first, it allows a balance of strength-emphasis and endurance-emphasis days, though it should be noted that both are usually trained to some degree each day; second, it ensures that within any given 7-10 day period of consistent PT, all the major PT sessions will be conducted; finally, and practically, it allows battalions to dedicate gym or other training space and equipment to one of the six companies for a given PT session. Although it is certainly not the only way to schedule training events, we believe the 6-day rotation strikes a reasonable balance between variety and specificity.

It is important that leaders make choices from the 6-day schedule that reflect the objectives of the phases as described above. For example, in Phase 1, the volume of training should be relatively light and the emphasis is on re-verifying mastery of all the drills that might not have been performed during deployment. So, an exhaustive workout like the stamina drill would not be a good choice.

6-Day Rotating Schedule					
PT1	PT2	PT3	PT4	PT5	PT6
1 Company per Day; Perform Sessions in Order					
Movement Preparation/Warm-Up (10 minutes)					
•Choose event from Strength Menu **and/or** •Choose event from Hybrid Menu **and/or** •Secondary Run **or** •Swimming	•Choose from Endurance Menu ***and*** •Choose from Core Menu	•Power-Endurance (Ground Base Preferred) ***and*** •Speed & Agility &/or Power Drill ***and*** •Partner Shuttle	•Interval Run (30/30s, intervals) ***and*** •Choose from Core Menu	•Choose from Strength Menu **or** •Choose event from Hybrid Menu **and/or** •Secondary Run **or** •Swimming	•Company-directed PT with endurance emphasis: -Tabata Intervals -swim -run -cardio equipment -footmarch
Recovery Activities/Cool-Down (10-12 minutes)					

Notes:

- Do not make up a missed PT session(s) because this will often lead to a log jam during equipment-intensive sessions.
- Do not choose exclusively from any one menu.
- Tactical training should generally occur once per week.
- Hybrid drills are best reserved for Phases 2-4.
- When weather precludes safe execution of speed & agility, work anaerobic endurance on the road or on cardio equipment. Spending more time on the Ground Base might be an option if only one or two platoons are executing PT3 on that day.
- For PT3, Ground Base is the preferred option, but if it is unavailable then choose another mode of training from the Strength or Hybrid Menu.
- APFT improvement training may supplement the main events for PT 2, 4 and 6.

An Option to Phased Scheduling

Another way to adhere to the principles of progression and recovery is to cycle workouts over a shorter time period. For example, instead of phases lasting several weeks, a single-month PT calendar could involve three relatively hard weeks of training and one week of active recovery (see the table below). During the week of active recovery, runs are shorter and/or less intense; strength days involve fewer sets and less weight, and movement skills training concentrates more on skill development and less on creating a conditioning effect. This method of PT scheduling allows leaders greater flexibility in arranging the PT calendar around the operational training calendar. Some light weeks will often occur naturally as training events preclude consistent PT.

Scheduling Option: 1 Light Week Per Month

	MON	TUE	WED	THU	FRI
W 1	>Endurance Menu (no intervals) >Core Menu	>Strength Menu >Speed/Agility or Power Drill >Partner Shuttle	>Intervals >Core Menu	>Strength Menu >Core Menu	Choose from: >Hybrid Menu >Footmarch >Pool
W 2	>Endurance Menu (no intervals) >Core Menu	>Strength Menu >Speed/Agility or Power Drill >Partner Shuttle	>Intervals >Core Menu	>Strength Menu >Core Menu	Training Holiday
W 3	>Endurance Menu (no intervals) >Core Menu	>Strength Menu >Speed/Agility or Power Drill >Partner Shuttle	>Intervals >Core Menu	>Strength Menu >Core Menu	Choose from: >Hybrid Menu >Footmarch >Pool
W 4	Schedule 3 light workouts. Execute 1 event from the Core Menu each day and choose one of the following as the primary endurance event of the day: >Pool >Cardio machines for 45 minutes >Endurance Menu (low-moderate intensity/duration)				

- If only **four PT sessions** are available for a given week, alternate days that emphasize endurance with days that emphasize strength. Week 2 above is an example
- If only **three PT sessions** are available for a given week, the preferred choice is two sessions that emphasize endurance and one strength.
- If only **two PT** sessions are available for a given week, perform one endurance workout and one strength workout.

Physical Training Events

Movement Skills

Speed/Agility/Coordination Power Drill

Core Strength Menu

360-Core Ring of Fire Med Ball Drills

Endurance Menu

Primary Runs

- **Distance Run**

Phase 1: 30 minutes
Phase 2-4: 40+ minutes

- **Interval Runs**

Phase 1: 30/30s
Phases 2-4: Track intervals or 1:30 repeats

- **Tempo Run**
- **Fartlek Run**

Secondary Runs

- 300-yd Shuttles
- Terrain Run

Foot march
Swimming
Cardio Machines

Strength Menu

Heavy Resistance

Power/Power Endurance

Muscular Endurance

Hybrid Drills Menu

Tabata Intervals Stamina Drill Partner Shuttle Med Ball Relays Tactical PT

RAW ASSESSMENTS

(DRAFT)

Introduction

Ranger missions require a broad range of physical attributes that can be grouped into three categories: Strength, Endurance, and Movement Skills. Within each category, the requirement is further defined as follows:

- Strength sufficient for load carriage, IMT, and CASEVAC without physical bulk that detracts from endurance or movement proficiency.
- Endurance sufficient for 1) long-range movement at a relatively low speed and 2) short, explosive movements followed by short rest and then repetition.
- Movement skills sufficient for the safe and effective execution of tasks that require power, agility, balance, and coordination

The primary purpose of the assessments is to identify individual and team/squad areas needing improvement. This in turn guides subsequent physical training. The first nine tasks are athletic assessments that should be conducted twice during a complete training/deployment cycle. Tasks 1-7 are conducted in order during a single, 90-minute PT session. Movement Prep as outlined in the RAW Notebook/Handbook (available on Darby) is conducted immediately before the assessments. Tasks 8 and 9 require gym equipment and are conducted separate from Tasks 1-7, but within five calendar days of those tasks. The RPAT is the primary tactical assessment and is conducted once per training/deployment cycle, separate from any athletic assessments by at least two days. Tactical foot marching is another recommended tactical assessment that is left to the discretion of BN leadership.

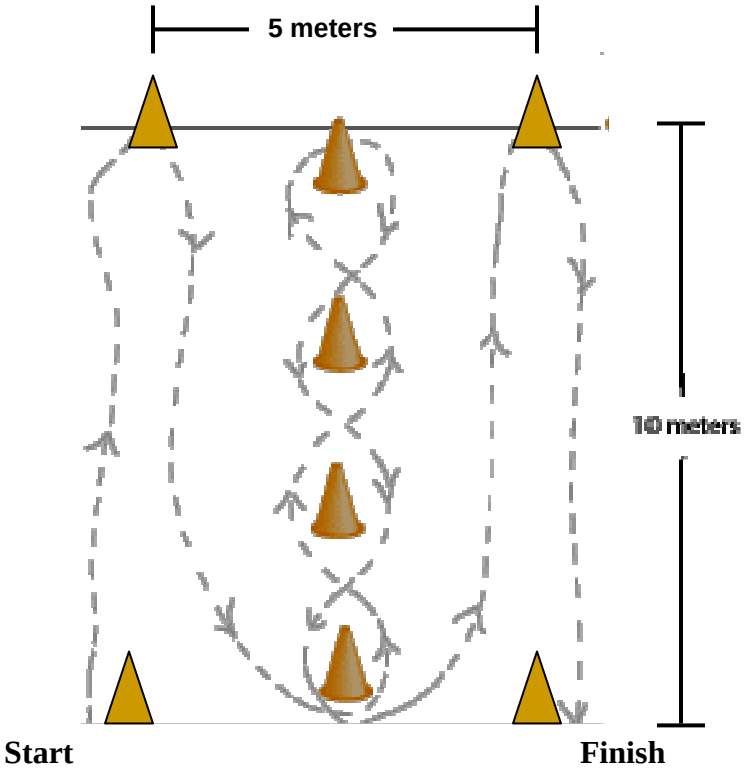
In addition to following the task/conditions/standards below, leaders should document the conditions under which the assessments were conducted (temperature, humidity, wind, and condition of the field). Documenting the individual and team/squad scores can be facilitated by using the sample scorecards in Appendices A and B of this document. Note that the **Functional Movement Screen** (FMS) and **BodPod** (body composition expressed in percentage of body fat) scores can be documented on the individual scorecard. Those two tests are screening assessments and are conducted separate from the physical assessments listed below. The BN medical section coordinates the screening assessments.

TASK/CONDITIONS/STANDARDS

TASK 1: **Illinois Agility Test.** The purpose of this test is to measure quickness and agility.

CONDITIONS: The length of the course is 10 meters and the width is 5 meters. Four cones are used to mark the outer boundaries. Four other cones are used to mark the start, finish and the two turning points. Each cone in the center is spaced 3.3 meters apart.

STANDARDS: Ranger lies face down behind the start point, outside the first cone. On the command "GO", Ranger jumps to his feet and negotiates the course around the cones to the finish (see the diagram below). If Ranger hits the cone enough to move its position, the test must be repeated. The grader records the total time taken from the command of "GO" to when the Ranger passes the last cone. Rangers that slip can request another attempt to improve their score. Rangers that fail to navigate the course properly may repeat the assessment either immediately or after others in the squad have finished. No rest period is required before moving to TASK #2.



TASK 2: **4kg Medicine Ball Toss.** The purpose of this test is to measure total-body power.

CONDITIONS: Given a 4kg medicine ball, a grassy field, a tape measure, and a line to mark the start.

STANDARDS: Ranger will have three attempts to throw the 4kg medicine ball maximum distance, using a backward/overhead throw. Ranger must start behind the start line, but may land across the line during follow through. Either a standing or falling follow through is allowed. On each rep, Ranger may perform up to three preparatory movements before throwing (simulating the throwing motion). The grader records the farthest throw to the nearest ft/in. No rest period is required before moving to TASK #3.

The 4kg Medicine Ball Toss

TASK 3: **Metronome Push-up.** The purpose of this test is to measure the muscular endurance of upper body pushing and core muscles.

CONDITIONS: Given a level spot on a grassy field and a metronome set to 1 second intervals.

STANDARDS: On the command "Get Ready," Ranger assumes the kneeling front-leaning rest position. On the command "Get Set," Ranger assumes the front-leaning rest position. On the command "GO," Ranger lowers his body until the upper arm is parallel to the ground. On the next metronome sound, Ranger must immediately return to the front-leaning rest. On the next metronome sound, Ranger must immediately return to the lower position as described above. When

Ranger can no longer stay with the metronome cadence, the test is terminated and the last number of correct reps is recorded. There are no rest positions for this test. The body must be maintained in a straight line throughout. If Ranger maintains the metronome cadence, but fails to meet other performance standards (does not extend elbows fully on rising, fails to bring the upper arms parallel to the ground on lowering, sags/arches the pelvis/trunk at any point) the grader will repeat the number of the last correct repetition and tell Ranger to make the proper correction. Alternately, the grader may tap Ranger on the arms or back to indicate the need go lower or keep the trunk straight. A five-minute rest period is required before beginning TASK #4.

TASK 4: **Pull-up.** The purpose of this test is to measure muscular strength and endurance of grip and upper body pulling muscles in relation to body weight.

CONDITIONS: Given a pull-up bar that allows full body extension without the feet touching the ground.

STANDARDS: Ranger starts from a free-hang position with arms straight and elbows locked, using an overhand grip, with the thumbs placed over the bar. On the command of "GO", Ranger pulls his body upward until his chin is over the bar. He returns to the straight-arm hang position with his elbows locked. He repeats this pull-up movement as many times as possible. The body must maintain a generally straight plane from head to toe. If Ranger kicks his way up, the pull-up involved will not be counted. The grader may slow the speed of movement to ensure the elbows extend fully upon lowering. The grader counts only the number of correct repetitions. A five-minute rest period is required before beginning TASK #5.

TASK 5: **300-yard Shuttle Run.** The purpose of this test is to measure anaerobic endurance.

CONDITIONS: Given a flat, grassy field with line markings 50 yards apart.

STANDARDS: Rangers can be ready in the sprint, crouch, or standup start positions as long as both feet and hands are behind the starting line. The grader uses the commands, "On your mark, get set, go." Ranger runs to the opposite end of the course and makes a direct turn by placing at least one foot on or over the line, returns to the starting line, makes another turn, and continues in this way for three round trips, sprinting past the finish line on the last trip. Do not take a circular path to make any turn. The grader records the total time taken from their command to Ranger completing the course. A one-minute rest period is given, then the 300-yard shuttle is repeated. The rest period begins after the last Ranger in a group crosses the finish line. Leaders should organize the men so that there is minimal time separating the first and last Rangers in a group. The grader averages the two repetitions to calculate the overall score for this event. A five-minute rest period is required before beginning TASK #6.

TASK 6: Heel Clap. The purpose of this test is to measure muscular strength and endurance of grip and core muscles that flex the lower body on a stable upper body.

CONDITIONS: Given a pull-up bar that allows full body extension without the feet touching the ground.

STANDARDS: Ranger starts from a free-hang position with elbows bent to approximately 90 degrees, using an alternating grip so that the body faces along the length of the pull-up bar rather than toward the bar. On the command of "GO", Ranger lifts his lower body upward and raises the feet over the bar to tap the heels together (repetitions will not be counted if only the toes touch over the bar). He returns to the starting position, maintaining the elbows at 90 degrees throughout. He repeats this sequence as many times as possible. The body must be held approximately straight in the lower position. Ranger cannot rest the legs on the bar or swing past the starting position on lowering. The grader counts only the number of correct repetitions. A ten-minute rest period is required before beginning TASK #4.

Note the starting and ending position for each repetition of the heel clap on the left. On the right, the heels touch over the bar, with the elbows remaining at 90 degrees throughout the repetition.

TASK 7: **BEEP Test.** The purpose of this test is to measure aerobic endurance.

CONDITIONS: Given two points, marked 20 meters apart, and one beep test audio file/CD.

STANDARDS: Ranger waits behind the start line and begins the event at the direction of the audio file/CD. Ranger continuously runs between the two marked points, touching the lines to the recorded beeps. It is not necessary to touch the line with the hands, nor is it necessary for both feet to cross over the line. When Ranger fails to make it to a line on a beep twice in a row the test is terminated. The score given to the Ranger is the last level he successfully completed. This score can then be used to estimate VO2 Max, a measure of aerobic fitness.

TASK 8: **185-pound Bench Press.** The purpose of this test is to measure upper body push strength.

CONDITIONS: Given a flat bench with a 45-lb Olympic bar with both 1 45-lb and 1 25-lb plate loaded on each side for a total of 185 lbs, and a spotter.

STANDARDS: Ranger will lie down on the bench with feet on the ground and the hips and back in contact with the bench. Ranger will grasp the bar using an over hand grip with hands placed shoulder width apart. Ranger will remove the weight from the rack. Help from a spotter is authorized when removing the weight from the rack but is not allowed once the bar is lowered for the initial repetition. Ranger will then perform repetitions by lowering the bar completely to touch his chest and pressing the bar until the elbows are completely extended. Repetitions are counted every time Ranger locks out the weight while maintaining contact with the hips and back on the bench and the feet on the floor. Exaggerated arching of the low back is a risk for injury and those repetitions will not count. Repetitions with correct form will be performed until Ranger can no longer complete a repetition, at which point the spotter will help Ranger rack the weight. There is no time limit. The event is terminated in the following ways: 1) Ranger stops or fails to maintain upward movement once a lift is started (hits a sticking point in the middle of a lift), or 2) Ranger violates execution standards for two consecutive repetitions despite prompting from the grader after the first violation. Ranger's score will be the number of correct repetitions performed.

TASK 9: **254-pound Ground Base Dead Lift.** The purpose of this test is to measure total-body lift strength from the ground.

CONDITIONS: Given the Ground Base Dead Lift machine, four 45-lb plates and two 25-lb plates.

STANDARDS: With two 45-lb and one 25-lb plate on each handle of the machine, Ranger will stand between the handles facing away from the machine. Foot placement is at the discretion of the individual. Ranger will squat by bending both the hips and knees and keeping the back straight. Grip on the handles must put the hands directly lateral to the ankles. Immediately before the lift, Ranger tightens all the core muscles, takes and holds a normal breath, looks slightly

upward, and pushes through the heels to come to a straight, upright stance. Ranger should exhale during the lift. At the top of the lift, the body is perpendicular to the ground, without bend in the hips or knees. Ranger may pause for up to two seconds at the top of the lift. Ranger then lowers the weight to the bumpers in a controlled manner and repeats as many repetitions as possible. There is no time limit. The event is terminated in the following ways: 1) Ranger stops, drops the weight or fails to maintain upward movement once a lift is started (hits a sticking point in the middle of a lift), or 2) the grader stops the event due to safety or performance errors (spine is rounding during the lift or Ranger violates execution standards for two consecutive repetitions despite prompting from the grader after the first violation). Ranger's score will be the number of correct repetitions performed.

For the Ground Base deadlift, place the feet according to preference, but for standardization the handles must be gripped in line with the outside ankle bones as depicted in the picture on the left.

TASK 10: **Ranger Physical Assessment Test (RPAT).** The purpose of this test is to measure all components of fitness (strength, endurance, movement skills), using tactically relevant tasks.

CONDITIONS – Given a 3 mile course, RBA, MICH helmet, Skedco w/ 160-lbs load, 20-foot fast rope apparatus, 20-foot caving ladder apparatus and an 8-foot wall.

STANDARDS – Complete a 3-mile run and combat focused PT course in less than 1 hour. The event will be conducted at squad level, with the mindset that the Ranger is competing against himself. Each time the event is conducted, each Ranger should see constant improvement in his time and ability to negotiate the course.

1. Conduct a 2-mile run wearing ACUs, boots, RBA and MICH helmet. The run will begin and end at a 20-foot fast rope.
2. After the completion of the run, immediately climb the 20-foot fast rope and do a controlled descent.
3. When the rope climb is complete, drag a 160-pound SKEDCO litter 50 yards, turn round and drag it back 50 yards to the start point.
4. Immediately following the SKEDCO pull, climb a 20-foot caving ladder and climb all the way back down.
5. At the bottom of the caving ladder, sprint 100 yards, turn around, sprint back 100 yards and climb over the 8-foot wall.
6. Conduct a 1 mile run wearing ACUs, boots, RBA and MICH helmet. The run will begin and end at the 8-ft wall. Time stops when you cross the line at the 8-foot wall.

Appendix A:

Sample Assessment Scorecard

Ranger 1	**FMS: 17/21**	**BodPod: 12% Body Fat**
Performance Assessments	**Raw Data Score**	**Squad Rank**
Illinois Agility Test	15 sec.	3
4-kg MedBall Throw	18 yards	3
Metronome PU	12 reps	4
Pull Up	15 reps	5
300-Yard Shuttles	62 sec. avg.	4
Heel Claps	8 reps	3
Beep Test	Level 11	2
RPAT	34 min.	3
Deadlift	7 reps	4
Bench Press	12 reps	3
*Lowest score represents best overall fitness within the squad.		**AVG 3.4***

Blank Assessment Scorecard

Ranger _____	**FMS: ____**	**BodPod: ___% Body Fat**
Performance Assessments	**Raw Data Score**	**Squad Rank**
Illinois Agility Test		
4-kg MedBall Throw		
Metronome PU		
Pull Up		
300-Yard Shuttles	1st_____ 2nd_____ AVG_____	
Heel Claps		
Beep Test		
RPAT		
Deadlift		
Bench Press		
		AVG_____

Appendix B

Sample Squad Data for a Single Event 300-Yard Shuttle Run (2 trials with 1-minute rest between)				
	1st Trial (s)	2nd Trial (s)	Average	Squad Rank
Ranger 1	60	62	61	4
Ranger 2	61	64	62.5	6
Ranger 3	58	59	58.5	2
Ranger 4	64	67	65.5	10
Ranger 5	59	62	60.5	3
Ranger 6	60	62	61	4
Ranger 7	62	64	63	8
Ranger 8	63	65	64	9
Ranger 9	57	59	58	1
Ranger 10	61	64	62.5	6
Average	60.5	62.8	61.7*	

* Can be used for comparison between squads.

Sample Squad Overall Ranking	
	Squad Rank
Ranger 1	**2.8**
Ranger 2	**3.2**
Ranger 3	**2.9**
Ranger 4	**7.2**
Ranger 5	**5.7**
Ranger 6	**4.4**
Ranger 7	**6.9**
Ranger 8	**6.9**
Ranger 9	**1.7***
Ranger 10	**4.7**

*Best score