Yongmudo Performance and Safety Can Be Improved by Traditional and Nontraditional Physical Conditioning Techniques

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Introduction

The yongmudo practitioner needs to show excellence in a diverse array of physical skills such as rolling, falling, kicking, punching, throwing, wrestling, and joint locks. These skills may be performed in a variety of settings: classes, demonstrations, belt tests, and self-defense. Each performance setting and skill set has unique strength and energy demands that can be only be met by carefully selected modes of training. The yongmudo student will need muscular and cardiovascular endurance, flexibility, balance, speed, agility, strength and explosive power to be able to operate at an optimal level of performance and safety. Consequently, yongmudo performance and safety are improved by the application of traditional and nontraditional forms of physical conditioning.

Mark Shirley, a 4th dan black belt in taekwondo and a certified personal trainer, writes in an article from the National Strength and Conditioning Association Journal,

> "…students of all ages, from the beginner to the world class Olympic athletes, will

> benefit from a scientifically sound and well rounded regimen consisting of taekwondo training, strength and conditioning, flexibility, plyometrics, and proper nutrition."[1]

Students achieve some degree of conditioning by simply attending weekly practices, but the addition of extracurricular training methods is essential if the athlete is interested in reaching the next level.

Consider staying in shape to play yongmudo rather than playing yongmudo to stay in shape. Supplemental training modalities and exercises provide a platform for extraordinary skill growth and improved safety of the physical infrastructure. This paper will explore the physiological components of the major movement patterns involved in yongmudo as well as provide information on exercises that will improve strength, balance, endurance, flexibility, and explosive power.

Strength Training

Strength is recognized as the ability to exert force.[2] From the ability to lift and throw your partner, to holding them in a pin, the exertion of force is integral to yongmudo. Increased strength is an asset to the yongmudo martial artist. In the paper "Weight training for Jujitsu," Nicholas Ratamess argues,

> "Strength may not be considered a crucial component to success, but stronger athletes possess several advantages particularly during grappling, joint locks, and various defensive techniques."[3]

He goes on to state that a program that develops this component is advantageous. Strength can be improved

through repetition of techniques and time on the mat, but Ratamess recommends a more comprehensive approach. This requires broadening the scope of practice to include strength or resistance training.

Many beneficial physiological adaptations occur with resistance training. Among them are an increase in muscle cross-sectional area and size, changes in the central and peripheral nervous system which promote increased activation of motor units, and improved structural integrity at the joints. All of these lead to an increase in force and power production capability. Resistance training improves not only the quantity of the muscle tissue but the quality as well.

Specificity, Overload, and Periodization

There are three important principles to consider when designing a resistance-training program for the yongmudo practitioner. The first is *specificity*, which states that training is most effective when it closely resembles the physical activity in which improvement is sought.[4] As stated in the National Strength and Conditioning Association's *Essentials of Personal Training*, "The movement patterns selected should be very close to the movements of the activity or sport."[5]

The second important principal in resistance training is the concept of *overload*. If the body is not continually challenged with new stimuli, it begins to adapt and plateau. To continue gaining strength, it is important to try new exercises, increase loads, and alter ranges of motion.

The third primary concept is *periodization*. This concept addresses the amount of time spent training at a specified intensity. Periodized plans consist of

different length training cycles—specifically, short-term microcycles (daily and weekly), mid-term mesocycles (one to four months), and long-term macrocycles (ten months to a year). The yongmudo semester may reasonably be conceived of as a mesocycle that is composed of smaller microcycles. The semester begins with base conditioning and progresses towards intense preparation for the belt test at the end of the semester. After a short break, the cycle begins again.

In addition to the concepts of specificity, overload, and periodization, there are three other key questions to consider when designing a resistance-training program:

- What muscle groups are being trained?
- What are the primary sites of injury for yongmudo?
- Which energy systems will be used?

What muscle groups are primarily used in yongmudo?

Considering the breadth of techniques performed, this is a difficult question to answer. An examination of the primary movement patterns shows that pushing, pulling, squatting, lunging and twisting are all prevalent. Yongmudo students use the legs, upper and lower back, hips, chest, abdominals, core musculature and arms extensively. Subsequent strength is needed in the hands, neck and around various joints. In essence, yongmudo is a total body activity.

Muscular balance should also be considered when incorporating weightlifting into training. “One of the strength and conditioning professional’s priorities should be to develop a balanced program, and ensure

proper ratios of strength from one group to another."[6] Training without this consideration could lead to muscular imbalances that alter the length-tension relationship and decrease force production. For example, if too much emphasis is put on training the muscles of the front side of the body, causing them to tighten and shorten, the muscles of the back side of the body may become elongated and lose strength due to decreased cross-sectional overlapping. This can be avoided by choosing a balanced selection of weight lifting techniques to work all of the major muscle groups and some relevant smaller groups such as the neck, shoulders, knees, hands and wrists.

What are the primary sites of injury for yongmudo?

In his paper, "Strength and Conditioning for Judo", John Amtmann writes

> "all major muscle groups should be included in the strength-training program for the judo athlete because of the diverse nature of injuries in grappling sports."[7]

Common injury sites in both judo and yongmudo are the knee, shoulder, ankle, neck, and elbow. Some injuries occur as a result of a trauma and some occur as result of general wear and tear. Careful strength training can reduce the likelihood of both types of injuries. Joint locks by their very nature are stressful to the joints. As stated in an earlier Amtmann article on training for mixed martial arts competitions, "Preventing injury in sports by training joints identified as frequently injured is known as *prehabilitation*."[8] Increasing the strength in the muscles surrounding those joints is essential for

anyone considering a long career in the martial arts. Muscle mass around the joints also helps pad the falls that are a major part of yongmudo training.

What energy systems will be used?

This is an important question to answer, as it will directly affect the intensity and duration of the resistance training. Most actions in martial arts require contributions from both the aerobic and anaerobic energy systems, but the percentage of anaerobic vs. aerobic use changes depending on the duration of the activity. For example a flying kick into a heavy bag uses the anaerobic energy system primarily, whereas a five-minute round of mat work depends primarily on the oxygen-fueled aerobic system. The yongmudo practitioner must develop endurance for both systems.

Power Training vs. Multi-Joint Exercises

One way to train the body to handle intermittent explosive bursts is through power training. This may include power lifts—or lifts of heavy weights using explosive power. These are total body exercises such as the power clean, the clean and jerk, and the hang clean. They closely mimic the metabolic and functional demands of judo style throwing. Analyzing such a training regimen, the Optimum Performance Training course manual affirms,

> "By consistently repeating the motor pattern that is required to perform a task, the nervous system will learn to minimize the amount of energy it needs to expend and still accomplish the same task."[9]

These techniques require a very solid knowledge of

weight lifting and are not recommended for beginners. A further discussion of explosive movement training can be found in the section on plyometrics and speed training.

An alternative to power lifts would be multi-joint exercises performed at a non-explosive speed, with moderate weights performed in succession over several minutes. This might include combinations of lunges, squats and presses. Such training also mimics the metabolic demands and movement patterns seen in yongmudo.

Program Design Considerations

Some very important considerations when designing a weight lifting program are how much weight to lift, how many sets and repetitions of each exercise to perform, and in what order. General guidelines set by the National Strength and Conditioning Association can help determine the correct volume, intensity, rest and load for a specific type of muscular adaptation.

When beginning a resistance-training program, it is important to improve neuromuscular facilitation and to build muscular endurance. This is achieved by using light weights for two or three sets of 15 repetitions, working to mild fatigue. Endurance training does not require very much rest between sets. This phase of training can last for three to six weeks assuming there are no contraindications or injuries present during that period.

Once the endurance phase is complete, it is time to begin *hypertrophy* or building muscle size. This adaptation is achieved by increasing the load and

decreasing the number of repetitions to between six and twelve. It is important to increase the rest between sets to at least 60 seconds. This allows the body enough time to rebuild its energy stores. The number of sets generally increases from three to five during the hypertrophy phase. This phase can last for one to three months depending on the amount of progress made and the end goal of the exerciser.

The final phase of resistance training is the strength phase. This phase is focused on the development of brute strength, and is commonly associated with athletic or sport training. It involves lifting weights in multiple sets of two through six repetitions with two to three minute rest periods inbetween sets. The yongmudo practitioner will want to progress to at least the hypertrophy phase if not all of the way to the strength phase to achieve the beneficial adaptations of resistance training. When ordering exercises, it is generally a good idea to perform multi-joint exercises first and then proceed to single joint exercises. Alternating between agonist and antagonist muscles, and/or upper and lower body is also considered beneficial.

Sample Strength Training Exercises

There are many exercises that can be performed safely by a yongmudo practitioner that do not require an extensive knowledge of weight lifting technique. Some require the use of free weights or machines and some are body weight based. Nine sample techniques follow, each described in considerable detail.

Chest Press

Conditioning Application

Punching, pushing, wrestling, rolling, chokes, unbalancing, down block, board and brick breaks, and blocking for counter throws.

Muscles Involved

Upper chest, specifically triceps and pectoralis major.

Preparation

Lay on a weight bench with two dumbbells. Position your feet on the floor straight-ahead or bend your knees and place your feet on the bench. Hold the dumbbells in your hands with arms extended towards the ceiling.

Movement

Draw in your navel towards the spine and squeeze your glutes. Your pelvis should remain stable throughout the entire exercise. Slowly lower the weight, keeping the wrist positioned over the elbows. Only allow the elbows to descend to the level of your bench. To perform the concentric movement, exhale and press weights up. repeat slowly to enhance stabilization strength. It is important not to let your back arch at any time during the movement.

Barbell Squat

Conditioning Application

Leg drive for grappling, throwing and unbalancing, lower body explosiveness for kicks, muscular endurance.

Muscles Involved

Lower body, gluteus, quadriceps, and hamstrings

Preparation

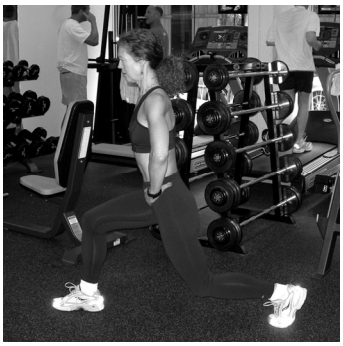
Stand with feet shoulder width apart and pointing straight ahead (do not turn toes out), place a barbell across the back of your shoulders or grasp dumbbells in your hands.

Movement

From the start position, draw your belly button inward toward your spine to activate the deep stabilizing muscles. Maintain this position throughout the entire exercise. Begin the movement by allowing the glutes to protrude out behind you. Descend slowly, bending at the hips and knees. During the descent, maintain weight distribution between the feet. Do not allow the feet to fall inward or roll outward. The knees should line up between the second and third toes. While maintaining focus in the lower abdomen, exhale as you

drive upward through the heels and return to an upright standing position. Repeat for the recommended number of times. Do not allow body weight to shift toward the toes. This exercise can also be performed standing on one leg only to optimize neuromuscular engagement, challenge balance and improve joint stabilization.

Lunges



Conditioning Application

Leg drive for grappling, throwing, and unbalancing, lower body explosiveness for kicks, isometric strength for finish offs, and muscular endurance.

Muscles Involved

Lower body, gluteus, quadriceps, and hamstrings.

Preparation

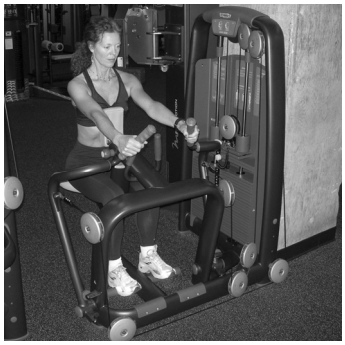
Stand up straight with dumbbell in hands, (or just use body weight). Place feet straight ahead and shoulder width apart.

Movement

Perform drawing-in maneuver by pulling your lower abdomen inward toward your spine (activating the deep stabilizing mechanism.) While maintaining

upright posture in the torso, step forward. Hold this upright position as you descend. Slowly bend at the knees and ankles—aiming for 90º of flexion in both knees. During the descent, maintain weight distribution between the heels and mid-foot. Do not allow your feet to cave inward or shift outward. The knees should track between the first and second toes. Do not allow the knee to travel forward of the toes. Do not drop the knee onto the ground. Perform downward reps slowly and concentrate on keeping the shoulder blades drawn together and the abs drawn in. Leaning forward can hurt the spine, knee and ankle and may be a result of poor hip joint flexibility and a weak core. Exhale and press through the front heel to come up. Repeat this motion for the recommended number of repetitions. Switch legs and continue.

Seated Machine Rows



Conditioning Application

Grappling, pulling techniques, throws, takedowns, elbow strikes, and formal punching.

Muscles Involved

Rhomboids, latissimus dorsi, posterior deltoid, mid trapezius, biceps and teres major.

Preparation

Adjust the seat height so that arms are approximately parallel with the floor when grasping the vertical handles. Adjust chest pad so that the arms are fully straightened when the weights are just off the stack.

Movement

From the start position, draw your belly button inward toward your spine. Draw the shoulder blades together prior to bending elbows. Stop the motion when the elbows are slightly behind the body. Maintain a straight the line between the wrist and the elbow. Slowly return to the start position maintaining tension between the shoulder blades. Avoid leaning forward or leaning backward as you perform this exercise. The torso should remain static through out the exercise.

Lat Pull Down Machine

Conditioning Application

Grappling, pulling techniques, throws, takedowns, elbow strikes, unbalancing.

Muscles Involved

Latissimus dorsi, rhomboids, levator scapulae, posterior deltoid, mid and lower trapezius, biceps and

teres major.

Preparation

Set the kneepad so that it provides light contact on the legs. Place hands on bar at a grip width that will allow the wrists to be perpendicular to the bar when the elbows are at 90º.

Movement

From the start position, draw in the abdominals towards the spine and lean back just enough so that the bar descends in front of you. Slowly start to pull the shoulder blades downward. While the shoulder blades continue to descend, the arms should follow, creating a 90º bend at the elbow. Do not allow head to jut forward or the abdominals to flex forward. Stop the pull when the bar is just below your chin. To complete the movement, let the bar travel upwards with control. The motion should stop just before the muscles relax.

Rear Delt Row

Conditioning Application

Grappling, pulling techniques, throws, takedowns, elbow strikes, unbalancing, and falling.

Muscles Involved

Posterior deltoid, rhomboids, upper and mid trapezius, and biceps.

Preparation

Use an elastic tube or a cable resistance machine. Grasp handles in each hand and step back a few paces from the point of origin. Take a staggered stance with the torso erect and the abdominals drawn in.

Movement

Raise the arms straight out in front of the body and then, on an exhalation, begin the pulling movement by drawing the elbows behind the body. Keep the elbows high and wide to form a 90º angle at completion. Arms remain parallel to the ground throughout the exercise. Squeeze the muscles between the shoulder blades throughout the movement. At the end of the pull, slowly release the arms back to the initial straight-arm position. Repeat as many times as appropriate.

Plank

Conditioning Application

Wrestling, punching, kicking, kihap, sticky hands, bracing for impact, and wrist techniques.

Muscles Involved

Total body, transverse abdominus, rectus abdominus and multifidies.

Preparation

Assume a prone position with elbows bent and positioned under your shoulders.

Movement

Draw your lower abdomen inward toward your spine, then lift up onto your forearms and the balls of your feet. While maintaining the draw-in maneuver, hold a perfectly straight back for 15 to 90 seconds. Press out through the backs of the legs and squeeze your glutes. Keep breathing steadily. Keep your chin tucked in. Do not allow yourself to either pike or sag through the lower back. Form is more important than how long you hold this position.

Body Weight Pull-ups

Conditioning Application

Grappling, pulling techniques, throws, takedowns, elbow strikes, unbalancing.

Muscles Involved

Latissimus dorsi, rhomboids, levator scapulae,

posterior deltoid, mid and lower trapezius, biceps and teres major.

Preparation

Place hands on pull-up bar with palms either facing forward or in towards each other. Your grip should be shoulder width or narrower with your body hanging straight down.

Movement

From the start position, draw your belly button inward toward your spine, exhale, and in a controlled manner, and pull your body upward. The shoulder blades should move downward and in while the arms flex. Focus on using the muscles of the back to initiate the movement. Do not allow your head to jut forward, your back to round, your legs to rise (to help start the pulling motion.) Do not allow your shoulders to rotate forward or hunch up by the ears. Also watch out for the temptation to arch the lower back or rock body to create momentum. Return to the starting position in a slow and controlled manner. The return motion should be stopped just before full extension of the arms. Relax arms as much as possible, placing the emphasis on back muscles.

Wood Chop

Conditioning Application

Throws, strikes, grappling, board and brick breaks, and weapons.

Muscles Involved

Total body!

Preparation

To engage the nervous system, perform a dynamic warm up prior to starting this exercise.

Start with the feet slightly wider than the width of the shoulders, toes slightly externally rotated.

Movement

This movement involves a cross-body chopping motion using a medicine ball, tubing or cable. Start with your knees slightly bent, both hands on the ball or handle and arms straight. The hands start at head height. Pull actively down and across the body. Pivot so that the feet track in the same direction as the hands. Stop when the weight is just outside the knee. Complete the motion by bringing the weight in the opposite direction—low to high. Repeat pattern back and forth for the desired reps.

Cardiovascular conditioning

Cardiovascular conditioning is part of a healthy lifestyle and an important pathway to stamina and performance in yongmudo. On any given day, the subject of a yongmudo class may call for aerobic or anaerobic endurance. Aerobic endurance is the ability to sustain an activity of moderate intensity over a long period of time (10–90 minutes). Anaerobic endurance is the ability to sustain very intense activity for shorter short period of time (from 30 seconds to five minutes). If you are preparing for a belt test or a competition, both types of endurance are vital. Nothing sabotages performance like "gassing out" or running out of wind. A study of karate practitioners found that their heart rate exceeded 191 BPM during 20 consecutive two-minute matches, "thus demonstrating the high aerobic and anaerobic metabolic demands of training."[10] Cardio training can be included in the warm-up portion of the class, but that alone is not sufficient for exceptional fitness. The American Council of Exercise recommends that all people get at least 30 minutes of cardiovascular exercise daily. For sport performance that amount is much greater.

Cardiovascular exercise is defined as significantly raising the heart rate and increasing the rate of respiration for a sustained period of time. This can be achieved by running, cycling, swimming, using cardio machines like a treadmill or elliptical, or by punching a heavy bag. In a yongmudo class, there are many ways to incorporate cardiovascular training. The students can do wind sprints, light sparring, or a panoply of other exercises that are fast paced and involve significant muscle recruitment.

The principle of specificity applies to cardiovascular training as well as resistance training. This means that you need to train in methods, intensities, and durations that are similar to the demands of yongmudo. The more closely the activities resemble yongmudo, the more likely it is that the benefits will carry over. An important question to ask when designing a cardio training program is "what aspect of my performance am I trying to improve?" This will start you thinking about the specific energy system that will be utilized during that skill.

If a person is looking to improve their stamina for kicking and punching sparring, what energy systems are used predominantly? We have already learned that the ATP-CP system is involved in short duration explosive movements like kicks and strikes, and the oxidative and glycolytic systems cover longer duration work. An average round of sparring lasts more than 10 seconds but less than 5 minutes. That means that more than one energy system is at play. To effectively train for this type of sparring, one must work with both explosive speed techniques and slightly longer anaerobic endurance. A round of wrestling has different demands. Work on the ground tends to be slower, involve more isometric muscle tension and fewer explosive movements.

Plyometrics

Plyometrics and speed training are extremely beneficial to a yongmudo practitioner. Ratamess writes,

> "Speed is an important component of [jujitsu] technique and is crucial to

> success at all levels. Power is essential when one needs short quick bursts of maximal force production such as in throws, take-downs, and strikes."[11]

Plyometrics are quick powerful movements that are preceded by a pre-stretch of the muscle similar to the stretching of a coiled spring. Speed is the ability to achieve high velocity and is characterized by explosive movements and the application of maximum force.[12] Speed training can be further broken down in to training for speed strength and speed endurance.

Speed strength is utilized in power lifts and throwing techniques. Speed endurance, which is the ability to sustain maximum speed over longer duration, is important for a 90 second round of bag work. Anyone interested in succeeding in standing sparring is keenly aware of the importance of speed endurance.

Plyometric training has consistently shown the ability to improve speed and power. John Amtmann writes,

> "Many strength and conditioning professionals believe that Olympic style lifts and other plyometric exercises will improve explosive strength that directly transfers to sports like reality fighting."[13]

Many injuries occur as a result of the inability to control decelerative forces. These situations are common in yongmudo—as in landing from a flying kick or dive roll. Plyometrics deal specifically with deceleration and rapid changes of direction and are therefore an excellent group of preparatory and conditioning exercises.

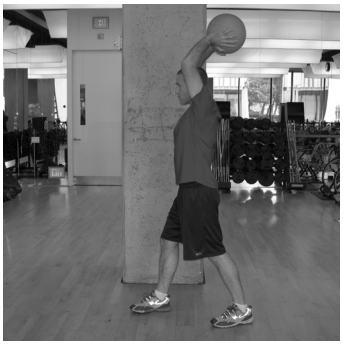
Designing a plyometric exercise program is similar

to designing programs for cardiovascular conditioning and resistance-training. The plyometric exercises and movement patterns selected should be similar to those found in yongmudo. These exercises should also follow the principle of specificity and overload and they should progress in a logical and appropriate manner. These are a few exercises that mimic the movements found in yongmudo.

Sample Plyometric Training Exercises

There are many plyometric exercises that can be performed safely by a yongmudo practitioner that do not require extensive knowledge or esoteric equipment, though a few require the use of free weights or other tools. Six sample techniques follow, each described in considerable detail.

Soccer Throw



Conditioning Application

Throws, strikes, down block, grappling, anaerobic endurance and weapons.

Muscles Involved

Upper back, latissimus dorsi, rhomboids, levator

scapulae, posterior deltoid, mid trapezius, triceps, rectus abdominis, teres major and core musculature.

Preparation

Stand facing a wall with your feet shoulder width apart, feet pointing straight ahead and a medicine ball that is 5-10 percent of your bodyweight.

Movement

Take a step forward and at the same time throw the medicine ball at the wall by pulling your arms down to your side and retracting and depressing your shoulder blades. Exhale as you execute the throw. Keep your abdomen drawn in and do not arch your back. Keep your chin tucked as the ball is thrown. Repeat exercise by alternating legs. Repeat for required number of repetitions.

Chest Pass

Conditioning Application

Punching, pushing, wrestling, rolling, chokes, unbalancing, face-fall, down block, board and brick breaks, anaerobic endurance and blocking for counter throws.

Muscles Involved

Upper chest, specifically pectoralis major, anterior deltoid and triceps as well as core musculature.

Preparation

To engage the nervous system, initiate a thorough dynamic warm up prior to starting this exercise. Stand in front of a wall with feet pointing straight ahead. Activate your core with a drawing-in maneuver.

Movement

Start with tall posture. Depress and retract your shoulder blades. With medicine ball close to chest and elbows high, explosively throw the ball towards the wall in front of you. Exhale as you perform the throw. Catch the ball on its rebound. Repeat for required number of repetitions.

Clapping Push-ups

Conditioning Application

Punching, pushing, wrestling, rolling, chokes, unbalancing, down block, board and brick breaks, anaerobic endurance and blocking for counter throws.

Muscles Involved

Upper chest, specifically pectoralis major, anterior

deltoid and triceps as well as core musculature.

Preparation

Lie face down on the ground with your hands slightly wider than shoulder width apart. Draw in the core muscles and keep a straight back.

Movement

Perform a push up with enough force to bring your hands off the ground while still maintaining a straight back and legs. Clap the hands as quickly as you can. Turn your head to the side if you fear you will not be able to get your hands under you before you reach the ground. Return to the starting position. Progressions include clapping near other parts of the body such as the glutes, over the head, and behind the back. Repeat for required number of repetitions.

Ice skaters

Conditioning Application

Leg drive for grappling, landing from flying kicks, throwing and unbalancing, lower body explosiveness, side kicks, and anaerobic endurance.

Muscles Involved

Lower body, gluteus maximus and medius, calves,

quadriceps, and hamstrings as well as core musculature.

Preparation

To engage the nervous system, perform a thorough dynamic warm up before to starting this exercise.

Movement

Begin in a fighting stance, with your knees and elbows bent. Perform a lateral hop, 3-4 feet in length, accelerating through the outside leg. Land on a flat foot and absorb momentum through knee and hip bending. Do not allow your knee to travel outside the line of the foot. Jump back to starting position with same technique. Make sure to keep your center of gravity inside the planted leg. Swing your arms to provide additional power. Repeat for required number of repetitions.

Clean and Press

Conditioning Application

Total body, leg drive for grappling, contralateral strength for throwing and unbalancing, lower body explosiveness for kicks, reverse action for board and brick breaks, and anaerobic endurance.

Muscles Involved

Lower body, gluteus, quadriceps, and hamstrings, core musculature, upper body, deltoids, biceps, triceps,

levator scapulae, and trapezius.

Preparation

Stand with your feet shoulder width apart and pointing straight ahead. Bend your knees slightly. Retract and depress your shoulder blades and draw your abdomen into your spine. Grasp a dumbbell in one hand.

Movement

Perform the squat with the dumbell at your side. Explosively straighten the legs. Drive the elbow high in a movement similar to an upright row. Make sure the dumbbell travels in a straight line (close to body.) As your hand travels past shoulder height and you arm prepares to press overhead into full extension, drop your body slightly under the weight by quickly descending into a half squat. Exhale and fully extended your arm over your head, push up from squat position with powerful motion. Return to the starting position and complete as many repetitions as required.

Jumping lunges

Conditioning Application

Leg drive for grappling, throwing and unbalancing, lower body explosiveness for kicks, isometric strength for finish offs, balance and anaerobic endurance.

Muscles Involved

Lower body, gluteus, quadriceps, and hamstrings

Preparation

Take a slightly staggered stance with arms on hips or in free hanging bent arm position.

Movement

Jump straight up as high as you can, switch arm/leg in mid-air (as when walking), and land in the deepest lunge as you can without over-stretching the hip flexors. Repeat as explosively as possible for desired repetitions.

Stretching and Flexibility

Stretching is an important component of physical preparedness in yongmudo. Having a limber body provides numerous tactical advantages and greatly reduces the risk of injury. Shirley writes,

> "A lack of flexibility may inhibit performance and may lead to injury … flexibility training should be practiced daily"[14]

In addition to reducing the risk of injury, stretching can provide greater range of motion around the joints and increase their mechanical efficiency. This results in safer and more effective movement. Stretching improves circulation and nutrient delivery throughout the body, as well as reducing viscosity in synovial fluid. In his text, *Program Design for Personal Trainers*, Douglas Brooks explains,

> "This change in synovial joint fluid may lead to a decrease in degenerative joint diseases and allow more freedom of

movement at the joint."[15]

Flexibility

Flexibility is joint specific and therefore a person can be flexible in some joints and not others. It is important to look at the joints that require the greatest range of motion in yongmudo (like the hip and shoulder) and make sure that there is ample flexibility in those joints. If there is not, a program of site specific stretches should be implemented. Even if you don't have a dramatic limitation, it is important to stretch every day.

Not everyone is born with innate flexibility, but all people can improve their ranges of motion given the correct training stimuli. Adaptations in flexibility through stretching occur in both the short term and the long term. Acute or short term adaptations are the result of the inhibition of the stretch reflex, a reflex that causes the muscles to shorten when they are stretched too far too fast. For long term adaptations, or plastic elongation, to take place, the muscles and fascia must be held in a lengthened position for a long duration. This causes the stretch reflex (muscle spindles) to fire at a much lower rate. This is enabled by slow static stretching, defined as "a controlled stretch that is held at the point of mild tension for 30–60 seconds."[16] Static stretching when performed after exercise has been found to reduce the incidence of delayed onset muscle soreness, and to speed recovery from exercise.

Dynamic Stretching

Another type of stretching prevalent in martial arts,

and athletics in general, is dynamic stretching. This involves working with a movement pattern and range of motion that is similar to that which will be attempted during the workout. Stretch kicks are an example of dynamic stretching. Warm-up should always be performed before dynamic stretching.

Self Myofascial Release, or foam rolling, is a form of stretching and muscle conditioning that is gaining popularity. It involves rolling the muscles over a foam cylinder and using the body weight to apply pressure. Similar to a deep tissue massage, this form of stretching stimulates blood flow, breaks up muscle adhesions, and increases muscular temperature. This can be an ideal form of stretching for people who have trouble consistently performing the more traditional forms of stretching.

Core Strength

Though a fairly recent phenomenon, core conditioning has become a key part of overall conditioning. It involves strengthening the spinal stabilizers -- the deep muscles of the abdomen and back. Having a strong core is absolutely essential to excellent performance in yongmudo. In his online article, *Core Development for Snow Sports*, Chip Richards states,

> "Solid core development is vital for teaching your body to move dynamically in skiing or any sport, and it is a huge factor in preventing injury and staying healthy during athletic endeavors."[17]

The benefits of core training are manifold. They include: increased overall strength, decreased lower

back pain, and improved balance. Richards adds,

> "By becoming stronger and more mobile in your trunk area, you take the strain off of your limbs, and your movements in general become more powerful and more efficient."[18]

The transverse abdominus, the central muscle of the core, is the first muscle in the body to be activated for just about every movement. The job of the transverse abdominus is to stabilize the spine. The nervous system will only recruit as much muscle as it feels its stabilizers can handle. As stated in the course manual *Optimum Performance Training*,

> "The body's core has to be operating with maximal efficiency to effectively utilize the strength, power, neuromuscular control and muscular endurance that have been developed in the prime movers."[19]

So it pays to have very strong core muscles. Not only will they prevent injury, but they also will lend power to your strikes, throws and kihaps. A strong core will help you roll smoothly and balance more effectively.

Different people define the core differently. Some consider the "core" to be solely the mid thoracic muscles that are involved in spinal flexion, extension, and stabilization. These would be the transverse abdominis, obliques, rectus abdominis, the lumbar multifidies and the pelvic floor muscles. Others believe that the area is much broader and involves muscles in the legs as well, such as the illiopsoas and the hamstrings. However you define it, a tangible difference can be felt once you add core training exercises to your workout.

Though the abdominal muscles are included in the core, just doing sit-ups will not do much to train the transverse abdominus. That muscle has little to do with movement and a lot to do with isometric stabilization. Exercises that train this region employ isometric contraction. The plank is an excellent example of an exercise that is targeted to improve isometric strength and endurance.

Balance

Balance is a key component of athletic performance. There are different types of balance needed for yongmudo. Dynamic stabilization is the most prevalent. Some examples of this would be spring hip throw, spin heel kicks, and handstand forward roll. Balance is part proprioception, part coordination and part joint strength.

Proprioception is when we use our senses to gather input from the outside world. When we increase the stimulation to the propioceptors by adding a balance challenge like an unstable surface or a visual challenge like closing our eyes, we provide added challenge for the nervous system to adapt to. Quoting from the National Academy of Sports Medicine's Optimum Performance Training course manual,

> "Training functional movements in a proprioceptively enriched environment (one leg, stability ball, balance boards, 1/2 foam roll, etc.) With correct execution (technique) at varying applicable speeds, facilitates the nervous system to achieve maximal sensorimotor integration, resulting in the selection of the proper motor pattern.[20]

When we perform exercises on a single leg, we strengthen the tendons, ligaments and muscles surrounding the joints. This helps joints stabilize better during a broader variety of techniques, and helps to keep them safer when things don't go as planned. For example if you train with single leg squats, you will improve the strength in the ankle, knee and hip joints. These are some of the most commonly injured joints in yongmudo. "Improvement of the strength of muscles surrounding a joint results in improved structural integrity of that joint."[21]

Conclusion

Yongmudo performance and safety are improved by the application of traditional and nontraditional forms of physical conditioning. To truly be able to perform well in yongmudo, one needs brute strength (wrestling), explosive power (throws, dive rolls and flying kicks), strength endurance (16-step and counter-throw form), cardiovascular endurance both aerobic and anaerobic (sparring and belt tests), static and dynamic flexibility (kicks), and exceptional balance and coordination (rolls and kicks). Well rounded physical conditioning can only be achieved by implementing, and maintaining an extracurricular conditioning program. Not only will this kind of training help you to excel in performance, it will help to keep you safe and healthy on the mat for your whole martial arts career. Once again, consider staying in shape to play yongmudo rather than playing yongmudo to stay in shape.

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Endnotes

[1] Shirley.

[2] Earle, p. 56.

[3] Ratamess, p. 8.

[4] Earle, p. 74.

[5] *Ibidem*, p. 362.

[6] Amtmann, p. 194.

[7] Amtmann and Cotton, p. 27.

[8] Amtmann and Berry, p. 67; emphasis by Copenhaver.

[9] Clarke, p. 189.

[10] Ratamess, p. 8.

[11] *Ibidem*.

[12] Earle, p. 426.

[13] Amtmann, p. 194.

[14] Shirley.

[15] Brooks, p. 142.

[16] *Ibidem*, p. 148.

[17] Richards.

[18] *Ibidem*.

[19] Clarke, p. 189.

[20] *Ibidem*, p. 202.

[21] Amtmann and Berry.