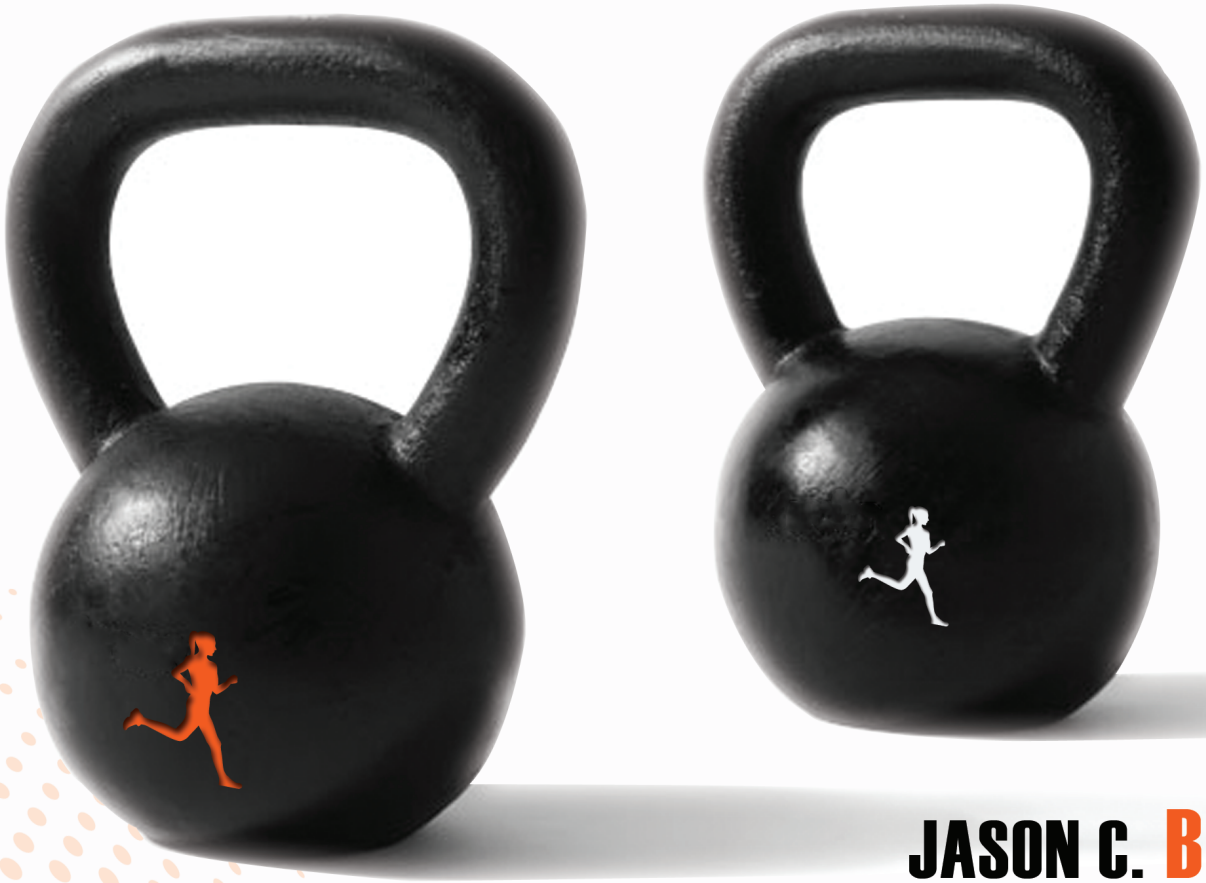
IYCA

KETTLEBELL

INSTRUCTOR COURSE



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IYCA INTERNATIONAL YOUTH CONDITIONING ASSOCIATION
The Leaders in Youth Fitness & Athletic Development Education

Kettlebell Instructor Course
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KETTLEBELL BASICS

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INTRODUCTION

The kettlebell has been used as a powerful tool for developing fun, functional and dynamic training and conditioning programs for decades. The purpose of this course is to provide personalized instruction, verbal, and visual teaching cues as well as partner exercises to maximize safety and promote high quality movement and instruction.

This course will also include extensive hands-on instructional examples to further solidify the fitness professionals' ability to both fully understand and effectively implement kettlebell training methodology in a broader scheme of program design.

This manual is intended to provide the fitness professional with a thorough understanding of the scientific theory grounded in contemporary exercise science, biomechanics and functional anatomy upon which modern kettlebell training programming should be built. Furthermore, comprehensive exercise illustrations, descriptions, and performance tips have also been provided to maximize the effectiveness and safety of each drill.

OBJECTIVES

The primary objective of this course is to ensure that the fitness professional learns, understands, demonstrates and can implement safe and effective kettlebell training methodology and techniques.

Additionally, individuals who complete the course should be able to explain and demonstrate each exercise with accuracy and precision. The fitness professional should be able to exhibit a comprehensive understanding of the scientific underpinnings of the program and apply such information meaningfully in a teaching/coaching and learning environment.

THE HISTORY OF KETTLEBELLS

The kettlebell has roots in the markets and fairs of the ancient world, where iron balls, many of them quite heavy, were used as standard weights. Strongmen would display their prowess by playing games or performing an array of stunts with these precursors to what is now commonly referred to as a kettlebell.

The historical record details the emergence of strongmen in Europe as early as the sixteenth century, with the iron ball lift included in the repertoire of strength feats.

However, it was in Czarist Russia that these iron spheres would eventually begin to be regarded for their true utility in the acquisition of strength and endurance. Now complete with a cast handle, the kettlebell or "girya" became a central tool for most any Russian strongman. Indeed, according to Pavel Tsatsouline, a leading proponent of kettlebell training in the United States, the terms "strongman" and "girevik" or "kettlebell man" were synonymous.

By the end of the Czarist era, it was conventional wisdom that kettlebell training or "girevoy sport" was a singular method for achieving overall physical development and muscular strength (Chaplinski, 1913). This assertion was later verified by two scientific studies: the first (Voropayev 1) proving the systemic benefits of kettlebell repetitions –gireviks are better prepared to face challenges across a wide range of athletics situations; the second (Vinogradov & Lukyanov 2) showing that kettlebell training improves balance, endurance and strength.

This would not have surprised men like Ivan Piddubny, "The Ukrainian Hercules." Beginning his wrestling career at the turn of the century, this once world-famous and undefeated champion used his kettlebell-derived stamina and might to subjugate all of his opponents for forty years.

Following Piddubny and other elite athletes, generations of Soviet (and now former Soviet) competitors have embraced the conditioning power of their beloved girya. Not surprisingly, the Soviet military followed suit.

In America, kettlebells have been around since the nineteenth century, perhaps earlier. Like the nameless gireviks who immigrated to this country in the 1800s, Arthur Saxon (born

Henning) carried his knowledge the kettlebell from his native Europe, harnessing its potency into a career that included several weightlifting records. Early in the twentieth century, hearkening back to those ancient fairs and markets, Charles MacMahon's Feats of Strength and Dexterity (1927) included a section on juggling kettlebells.

Despite its effectiveness, this rugged old tool could not thrive in an America always in search of the novel or new, and a fitness industry increasingly eager to fulfill that desire.For the greater part of the twentieth century, the girya, a staple in Soviet gyms was lost to Americans. That is until now. There is currently a growing movement to reassess the natural health claims and crude fitness tools received from our ancestors. Everything old is new again. And at the start of the twenty-first century the newest way to achieve a superior conditioning is to use the ancient kettlebell.

KETTLEBELL SAFETY

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MIKE DAVIS, DPT, ART

GENERAL GUIDELINES FOR SAFETY, INJURY PREVENTION & PROGRAM EFFICIENCY WITH KETTLEBELL TRAINING

Participation in most sporting events and/or recreational activities has its inherent risks. The key in minimizing these risks lies in the comprehension of the activity. Olympic lifting and free-weight training have often been maligned as potentially dangerous, particularly for a developing young athlete. The same holds true for kettlebell training. However, such notions are not based in fact, as participation in most team sports exposes the athlete to a higher risk of injury than resistance training performed under the supervision of a qualified and competent coach.

The following list is comprised of general guidelines that should be used when introducing an athlete to any new training and conditioning mode, including kettlebell training.

- Always provide a complete explanation of potential risks and active steps taken to minimize their impact.
- Get medical clearance for those with existing conditions such as orthopedic injuries, cardiopulmonary pathologies, cardiovascular pathologies, etc.
- Make expectations clear up front. This could include specific instructions such as being on time, being attentive, wearing proper attire, being respectful, working hard, being diligent in time away from the training facility, reporting all injuries/aches & pains, and being honest about the athlete's responsibility in the training process. This is very important as it will set the tone for the relationship between the fitness professional and the athlete.
- Ensure that the environment is appropriate for the training modality. Kettlebells require approximately at least a 5' x 5' foot area for ballistic lifts such as swings and snatches should the athlete need to release the kettlebell. In addition, a resilient floor is recommended to absorb the pounding that comes with kettlebell training.
- Ensure that the program follows the building blocks of functionally efficient movement. One must be able to correctly perform a bodyweight squat before being expected to execute a kettlebell swing, just as one should be able to perform an efficient high-pull before being taught to snatch. Remember as with Olympic lifts, dynamic kettlebell lifts require a degree of skill that must be taught in a manner appropriate for each individual.
- ALWAYS stress quality over quantity. Most of the injuries acquired during training are because of dysfunctional movement and/or tissue overload. Never allow the athlete to repetitively perform an exercise with poor form as it will result in a dysfunctional movement

pattern and tissue overload. The same is true for using a kettlebell that is too heavy.

- Instruct athletes to always be most concerned with personal safety rather than equipment preservation. Athletes should be taught to safely and effectively release any external load such as a kettlebell in the event that control of the implement is lost.
- Be sure to begin sessions with a proper warm-up/movement prep module and end with cool-down/stretching program.

While infrequent, injuries are sometimes a part of training and the fitness professional must know the appropriate steps to take prevent and on occasion manage such injuries. Any health and fitness professional should have a current CPR certification. It is important to understand that unless one is qualified, the urge to treat an injury should be avoided and instead referred to more qualified personnel. One of the best ways to prevent injuries is to implement programs that reflect balanced development, as that is the essence of program design. There are many "kettlebell exercises" that address many muscle groups by virtue of their multi-joint, multi-planar movements. For example, the "windmill" utilizes muscles of the hips, trunk, back, shoulder girdle, chest, and arm in unison.

The center of mass in a kettlebell falls away from the handle, resulting in additional rotational torque not normally felt with "traditional" training modalities such as barbells and dumbbells. Because of this added dimension, it is necessary to evaluate the participant's ability to control this rotational torque. A lack of control will likely result in faulty movement patterns and predispose the athlete to a cumulative trauma injury over time.

Another component of balance involves flexibility and tissue mobility. Whenever possible, the fitness professional must make sure that exercises are performed within an appropriate range of motion. Exercises performed in a shortened range result in inappropriate muscular accommodation and will most likely negatively influence normal range of motion at that joint and potentially other joints in the kinetic chain. Conversely, exercises performed in an excessive range predispose the connective tissue to injury while also compromising the force production capacity of the muscles due to excessive lengthening and inadequate cross bridge articulation. A basic flexibility and soft tissue management program should be implemented with any resistance training program.

Despite a well balanced training and conditioning program, even a well-trained athlete may still be injured due to participation in sport. While rest and ice are common initial treatment techniques for most any soft tissue and/or orthopedic injuries, it may be necessary to contact emergency medical personnel or refer the athlete to an athletic trainer or physical therapist for evaluation. With experience, one will develop the skilled sense of when to encourage an athlete to continue (i.e. - momentary muscle fatigue) or to discontinue (i.e. – muscle strain) and advise medical attention. When in doubt, ALWAYS err on the side of safety for the athlete and never push to continue unless no doubt about the severity of the issue exists.

Following the instructions depicted in this manual in addition to the above noted guidelines will greatly reduce the chance of injury to the athlete.


44 lb
20kg

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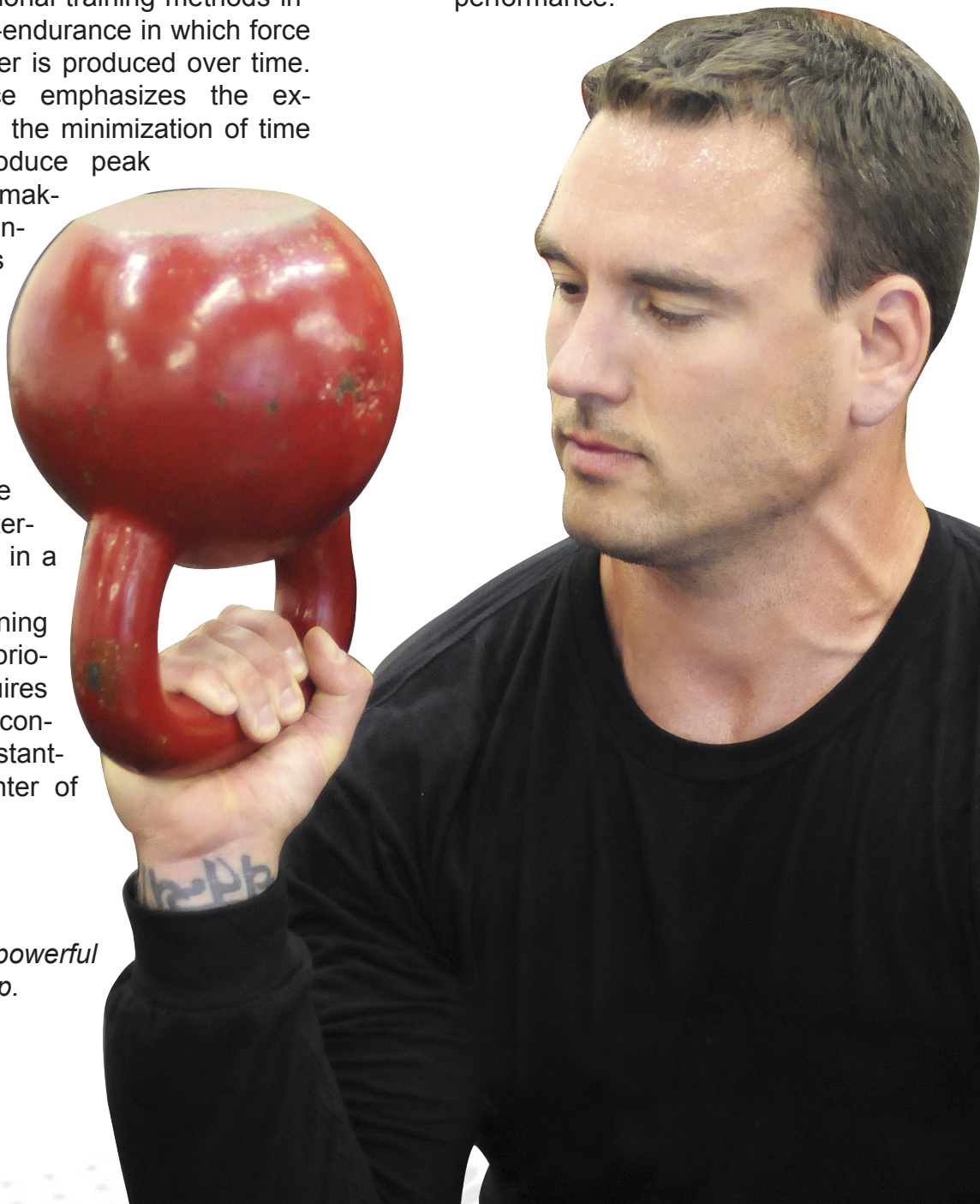
BENEFITS OF KETTLEBELL TRAINING

PROPOSED BENEFITS OF KETTLEBELL TRAINING

The effectiveness of kettlebell training has been widely debated and the subject of considerable disagreement among fitness professionals. Kettlebell proponents cite a number of potential advantages of the kettlebell over alternative resistance implements.

- Kettlebell training produces strength at extreme ranges of motion. Many typical kettlebell movement complexes require movement through a greater range of motion than more isolative traditional resistance exercises. Additionally, the explosive nature of most of these complexes is more likely to elicit a stretch reflex, thereby potentially increasing the athlete's ability to generate force and power.
- Kettlebell training exposes weaknesses and can be used to effectively address muscular imbalances. Since kettlebell training movement complexes are typically performed unilaterally, it is likely that deficiencies and imbalances will become readily apparent during exercise performance. Weaknesses such as unilateral grip endurance deficits or limitations in shoulder strength and range of motion are commonly noted during the initial stages of kettlebell training implementation. As such, once identified, such deficiencies can be effectively addressed through subsequent training sessions.
- Kettlebell training creates strong yet flexible joint structures. Kettlebell training complexes increase the demand for dynamic joint stabilization, which can lead to positive adaptations over time that can potentially reduce the risk of injury and accommodate more efficient force production. The relatively unfamiliar offset center of mass of a kettlebell can trigger new and unique muscle recruitment and proprioceptive input patterns relative to more traditional resistance implements.
- Kettlebells provide considerable flexibility and endless exercise variations with just one tool. Simply by changing the grip or repositioning the kettlebell carriage during movement, the entire feel and complexity of the movement can be altered and progressed. This feature alone makes kettlebell training particularly well-suited to a small group or class setting that requires a wide variety of difficulty depending upon the strength and abilities of the class participants.
- Kettlebell training complexes are effective in teaching the athlete to both absorb and redirect force system-wide. Since most kettlebell training complexes are multi-joint in nature, the athlete is exposed to force application over the greatest range of motion possible using as many joints as possible. This force application has excellent carryover and application to a sport environment in which forces of unpredictable magnitude and direction from opponents, the playing surface, and even sporting implements must be effectively managed to maintain balance and produce optimal reaction forces.

- Kettlebell training complexes can amplify power output. Kettlebell training complexes are most often performed rapidly or explosively. Additionally, the production of powerful movements over an extended period of time, or power-endurance, is most typical of kettlebell training. This differs from more traditional training methods involving strength-endurance in which force rather than power is produced over time. Power-endurance emphasizes the explosiveness and the minimization of time required to produce peak force, thereby making kettlebell training complexes more representative of most sporting situations where it is the ability to produce power rather than force that typically determines the victor in a given situation.
- Kettlebell training maximizes proprioception and requires the athlete to contend with a constantly changing center of mass. Since the kettlebell's center of gravity lies outside the grip, it can better replicates the unpredictable forces and loading patterns typically encountered in athletic participation. This unique feature of the kettlebell will help reinforce this aspect of sports performance.



Kettlebell training builds powerful forearms and a strong grip.

- Kettlebell training builds powerful forearms and a strong grip. Kettlebells possess a thicker handle than their barbell and dumbbell counterparts, taxing grip and encouraging the development of greater forearm strength. Furthermore, the smooth cast iron construction of most kettlebells requires a firmer grip than the high friction knurled grip used in most dumbbells and barbells.
- Kettlebell training complexes most often elicit an excellent cardio–respiratory training response. Kettlebell training complexes often involve the entire body in a significant expenditure of energy to produce explosive movement. When designed with appropriate work to rest intervals, such total body training can expose the athlete to a concurrent conditioning effect that stimulates positive neuromuscular as well as cardiorespiratory adaptations.
- Kettlebell training eliminates the need for a large training facility. Kettlebells possess a very small footprint, meaning that they take up very little floor space. Kettlebells do not require expensive racks and can easily and safely be stored in a corner or underneath other equipment.
- Kettlebell training can be very time efficient. Due to the total body nature of most kettlebell training complexes, the athlete can undergo a significant training stimulus to the musculoskeletal system throughout the entire body after just a few rounds of a few basic movement patterns. By eliminating non-functional and time consuming isolative movements, kettlebell training complexes provide significant system-wide training stimulus in a minimal amount of time.

Clearly, kettlebell training complexes can provide a number of unique and positive advantages over more traditional resistance implements including dumbbells and barbells. As such, kettlebell training can be an invaluable training tool to enhance overall program effectiveness, athlete interest and motivation, and ultimately resultant athletic success.

SCIENTIFIC FOUNDATIONS

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SCIENTIFIC FOUNDATIONS OF KETTLEBELL TRAINING

The competent and skilled fitness professional should not only be concerned with exercise technique but also the influence of each exercise on posture, alignment, body mechanics and the associated musculature. Regardless of the specific goals of training, a number of fundamental principles will influence each training session and are applicable to virtually any training goal. The following fundamentals are foundational concepts critical to developing the knowledge, skill and ability to develop safe and effective training programs.

Anatomy: The study of structure.

Physiology: The study of function.

Movements

There are six primary movements that can occur around a joint structure. These are flexion, extension, abduction, adduction, rotation and circumduction.

- **Flexion**: A decrease in the angle between two body segments.
- Extension is an increase in the angle between two body segments.
- **Abduction:** The movement of a body segment away from the midline of the body.
- **Adduction:** The movement of a body segment towards the midline of the body.
- **Rotation**: Circular movement of a body segment around an axis.
- **Circumduction:** A combination of movements in which the individual circumscribes shape of geometric cone with the involved extremity.

Planes of Motion

There are three imaginary lines that pass through the human body that are useful in further defining the specific nature and direction of a given movement or series of movements.

- **Sagittal:** The vertical plane that divides the body into left and right portions. Anterior/posterior movements such as knee flexion and extension occur primarily in the sagittal plane.
- **Frontal:** The vertical plane that divides the body into anterior and posterior portions. Lateral movements such as shoulder abduction and adduction occur primarily in the frontal plane.
- **Transverse:** The horizontal plane that divides the body into upper and lower portions. Rotary movements such as hip internal and external rotation occur primarily in the transverse plane.

Roles of Musculature

Any one muscle can perform several tasks. This task can differ according to which joint that particular muscle is working around. Each muscle may act as an agonist, antagonist, stabilizer, and synergist and as a neutralizer.

- **Agonist:** The muscle that produces the most force to move a body segment; the prime mover.
- **Antagonist:** The muscle that acts in direct opposition to the agonist or prime mover.
- **Synergist:** A muscle that assists the agonist in producing movement.
- **Stabilizer:** A muscle that supports a joint or the body while the agonist and synergists generate movement.

- **Neutralizer:** A muscle that cancels out or otherwise counteracts unwanted or unnecessary motion.Biomechanics: the study of the physical influences that govern human movement.
- **Kinesiology:** The study of human movement from an anatomical and/or mechanical perspective.
- **Center of gravity:** The point at which all the body's mass seems to be concentrated; the balance point of a body; the point around which the sum of the torque's segmental weights is equal to zero.
- **Force:** The energy expended to change the state of motion of a body. The influence of any force is determined by the magnitude or size, the direction, the point of application, and the line of action.
- **Direction of force:** The path along which force is applied.
- **Point of force application:** The specific location where force is introduced to the body or system receiving it.
- **Line of action:** A straight line through the point of application extending indefinitely along the direction of force.

Force can either be internal or external. Internal force is produced by a concentric contraction of skeletal muscle, while external force is introduced by gravity or some other object applying force from outside the body to elicit movement.

Newton's Laws of Motion

- **Newton's First Law, The Law of Inertia:** A body will remain at rest or in motion until acted upon from some outside force. A heavier object requires more force to overcome inertia and set the body in motion. A heavier object also requires more force to stop or alter motion.
- **Newton's Second Law, the Law of Acceleration:** Force is the product of mass and acceleration. Acceleration is proportional to the force acting upon on the body and is in the same direction as that force.
- **Newton's Third Law, The Law of Action-Reaction:** For every action, there is an opposite and equal reaction.

Motions utilized in kettlebell training complexes can take multiple forms, including:

- **Linear motion:** A body translating and moving in a straight-line with the change in position occurring relative to one or more reference points. Linear motion occurring in a straight line is referred to as rectilinear motion.
- **Curvilinear motion:** Motion occurring along a curved path.

Laws of Levers

A lever is most simply defined as a rigid object about which forces are applied at a minimum of two other. The fulcrum or axis serves as the pivot point within that lever system. Two forces act within a lever system, including the effort force and the load or resistance force.

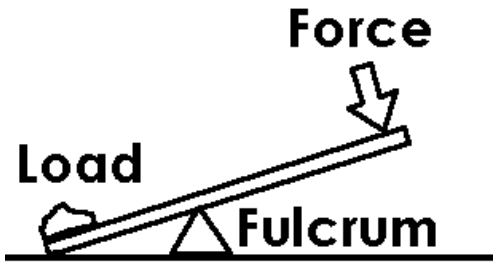
- Effort force (E): Force used to oppose the resistance force.
- Load (L): Force produced by an object that one is trying to move or oppose.
- Effort arm (EA): Distance along the lever from the point of application of the effort force to the fulcrum.
- Resistance arm (RA): Distance along the lever from the point of application of resistance force to the fulcrum.
- Moment arm of effort (MAE): The perpendicular distance from the effort force line to the fulcrum.
- Moment arm of resistance (MAR): The perpendicular distance from the resistance force line to the fulcrum.

How Levers Work

Levers rotate from the application of force. This rotation is influenced by the amount of force, the direction of force and the location along the lever where that force is being applied. To adequately describe a force, all three components must be characterized.

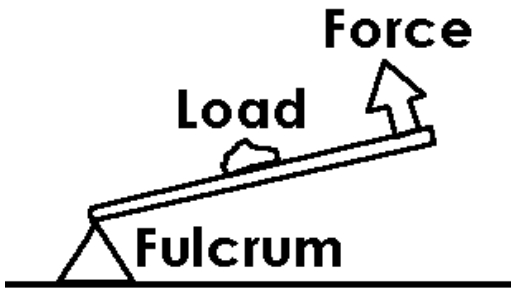
There are three classes of levers:

- First class lever: A lever that has the fulcrum between the resistance force and the effort force. A see saw is a common example. Relatively rare within the body, the cervical extensors utilize a first class lever system to extend the head.



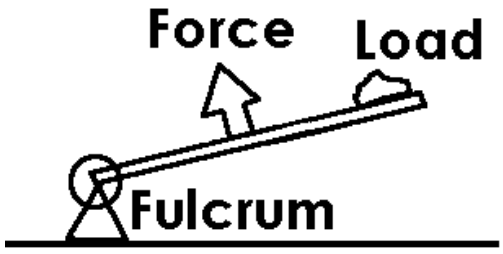
First Class Lever

- Second class lever: A lever that has its load positioned between the effort force and the fulcrum. A wheelbarrow is a common example. Within the body, the gastrocnemius/soleus complex utilizes a second class lever system to perform a heel raise.



Second Class Lever

- Third class lever: A lever that has its effort force situated between the load and the fulcrum. Third class levers are the most common in the human body and the biceps brachii is a common example when producing elbow flexion.



Third Class Lever

The rotational result of force is known as torque. Torque is the product of force and distance. The amount of torque is determined by two factors: the amount of force and the perpendicular distance from that force to the fulcrum.

Effort Torque-TE = E x MAE

Resistance Torque – TR= Rx MAR

Kettlebells & Biomechanics

Understanding torque is essential in kettlebell training since the kettlebell allows for rotation around the wrist. This rotation around the wrist increases torque elicits additional proprioceptive input, increased motor control and motor unit recruitment and increased intramuscular coordination.

Since the kettlebell extends away from the athlete's grip, an elongated moment arm of resistance is introduced. Since resultant torque is the product of resistance and the length of the moment arm of resistance, additional torque is consequently introduced into the musculoskeletal lever system, as well.

Interestingly, this additional torque is not experienced only at the wrist. Instead, increased torque is similarly introduced proximally up the kinetic chain, manifesting at the elbow and shoulder and elbow. Functionally, this increased torque could potentially be responsible for enhancing recruitment and activation within the dynamic stabilizers within the entire kinetic chain. This can lead to improved performance across a broad range of activities from daily chores to top-level athletic competition, not to mention a leaner, stronger, and more injury resistant body.

5

BIOMOTOR DEVELOPMENT

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BIOMOTOR SKILL DEVELOPMENT

As a fitness professional, it is often necessary to help athletes achieve numerous and diverse goals. Some athletes want to get stronger. Some want to be more explosive on the court or the field. Still others simply want to look and feel better and develop some measure of baseline fitness. The relative success of any program is entirely dependent upon the developed exercise prescription presumably built around those goals. However, before prescribing any specific program, particularly for the developing athlete, it is essential that the fitness professional possess a thorough understanding of the nature and optimization of the fundamental bio-motor abilities.

Strength

Strength is most simply defined as the ability of the neuromuscular system to produce force. Several factors may influence strength, including:

- Structural /anatomical factors
- Physiological/biomechanical factors
- Psycho-neural/psycho-social factors
- External/environmental factors

All other bio-motor skills are dependent upon strength. If the neuromuscular system is unable to produce force, no other expression of human movement is possible such as power, endurance or power-endurance.

Strength is best developed through the use of low repetitions, namely 1-5 repetitions per set using a weight that is 80-95% of the 1 repetition maximum. For younger athletes, such high loads should be reduced but high intensity remains a key to positive strength adaptation. The number of sets can vary and can be quite high, even as high as 10 sets per movement. Longer rest periods of 2-3 minutes are recommended to improve strength. A very common set/rep scheme to improve strength is 3-5 sets of 3-5 reps with 3-5 minutes rest between each set. One popular group of kettlebell exercises for strength development strength are known as “grinds.” Grinds are relatively slow, controlled variants of fundamental movements such as deadlifts, overhead presses and front squats.

Power

Power is the rate at which work is performed, or work/time. Power is simply the combination of strength and speed. Kettlebell training is ideal for the development of power simply because most kettlebell exercises other than grinds are not be performed slowly and thereby promote rapid eccentric and concentric muscular actions. Power is best developed by using a slightly lighter weight and increasing speed. Most sources suggest loading at 40-60% of the calculated 1 repetition maximum and moving as quickly as possible to best develop power.

Kettlebell exercises intended to develop power are known as ballistics. Ballistic kettlebell exercises involve an explosive start, little muscular tension within the midrange of the exercise and end with a stable and solid resting position. Snatches, swings and cleans are all examples of ballistic kettlebell exercises.

Endurance

Endurance is defined as the ability to continue a physical performance over an extended period of time. There are two forms of endurance, namely aerobic endurance and anaerobic endurance. Aerobic endurance involves optimization of the efficiency by which the body is able to exchange gases at the cellular level and

transport oxygen to and waste products from working tissues. Anaerobic endurance deals mostly with bioenergetics within the cell during muscular actions.

Power-Endurance

Power-endurance is defined as the ability to produce rapid and powerful muscle actions over an extended period of time. Most sporting events are power-endurance events. For example, a football game may last 2 hours, but the players are still required to be explosive and powerful on the field regardless of how long the game lasts.

Kettlebell training complexes are well-suited to develop power-endurance for two reasons. First, as stated previously, most kettlebell exercises cannot be performed slowly. Second, since kettlebells come in fixed weights, a natural way to increase intensity is by increasing the number of repetitions performed within a set. Repetitions may reach into the hundreds for advanced athletes and regularly reach into the 20-30 range for even novice athletes who are appropriately loaded. Several sets of high repetitions best develops power-endurance.

A Word About Selecting the "Right" Kettlebell

While selecting the proper kettlebell should be based on each individual's experience and fitness level, a number of general guidelines may prove quite helpful. The average adult male can usually begin with a 16 kg kettlebell for most lifts. Stronger males will progress to the 24 kg or even the 32 kg bell. The average adult female can usually begin with an 8 kg implement, while stronger women can start with a 12 kg kettlebell. These loads will vary significantly for youth athletes depending upon age and level of maturation. When working with an athlete new to kettlebell training, it is best to begin with a weight that is easily managed and eventually progress to a heavier kettlebell only when proper form is mastered.

6

MOTOR SKILL AQUISITION

MOTOR SKILL ACQUISITION

One of the primary responsibilities of the fitness professional is to assist athletes in acquiring new skills to further enhance fitness or bring them closer to stated goals. While such skill acquisition can take several forms, motor skill acquisition is likely most important, particularly in the developing athlete. Motor skills proficiency is determined by the quality of movement above all other considerations.

Psychologist E.R. Guthrie (1952) defined skill as the "ability to bring about some end result with maximum certainty and a minimum outlay of energy, or of time and energy." Skill can also be defined as proficiency, facility or dexterity that is acquired or developed through training, experience or as a result of practice. For the fitness professional, the primary goal of training is to arrange training sessions in such a manner that learning is promoted and desired skills are reinforced so that the athlete will be able to successfully recall and express those skills in the future. This process of motor learning involves lasting change in the body's internal processes that determines capabilities to produce a motor skill.

All learning requires repetition and rehearsal. Proper rehearsal is the greatest contributor in acquiring new motor skills. Particularly when working with developing athletes, it is helpful to view training sessions as more than simple strength or fitness acquisition but rather practice in developing and refining progressively complex motor patterns. To that end, the fitness professional can employ a number of techniques to optimally arrange practice sessions to accelerate the athletes' ability to learn new movements.

Two such arrangements are known as blocked practice and as random practice. Usually, training sessions consist of several distinct movements. In a blocked practice session, the athlete repeats a single skill for a predetermined interval before moving to another skill. For example, a session might consist of 15 minutes of kettlebell swings, 15 minutes of kettlebell jerks, and 15 minutes of kettlebell front squats without mixing or overlapping drills.

Conversely, utilizing a random practice session, the athlete would rehearse those same three drills but in a mixed format, rotating each drill and never repeating the same exercise twice in a row. Blocked practice is more effective during the actual training session, as athletes will be more successful and better able to repeat those desired skills more efficiently while only focusing on one drill at a time. However, performance of the skill is enhanced at a future date if random practice is chosen.

This phenomenon is known as the contextual interference effect. Basically, the need to mentally and physically recall each movement creates a deeper impact on the long-term memory. This deeper impact is more resilient and easily summoned in future attempts at performing the same skill. For example, when practicing three different kettlebell skills (A,B, and C) in a training session, the athlete might experience greater short-term performance gains by using a blocked format, AAA,BBB and CCC. However, the athlete will retain more movements with more adaptable technique if a random format is utilized such as ABCCBABABB. The more diverse the scheduling of practice the greater the level of contextual interference.

For a developing athlete just learning motor skills, the blocked practice method is likely best initially, however, once the athlete grows increasingly familiar with a particular movement pattern, it is best to work in some measure of randomness and unpredictability. This will increase contextual interference and encourage retrieval

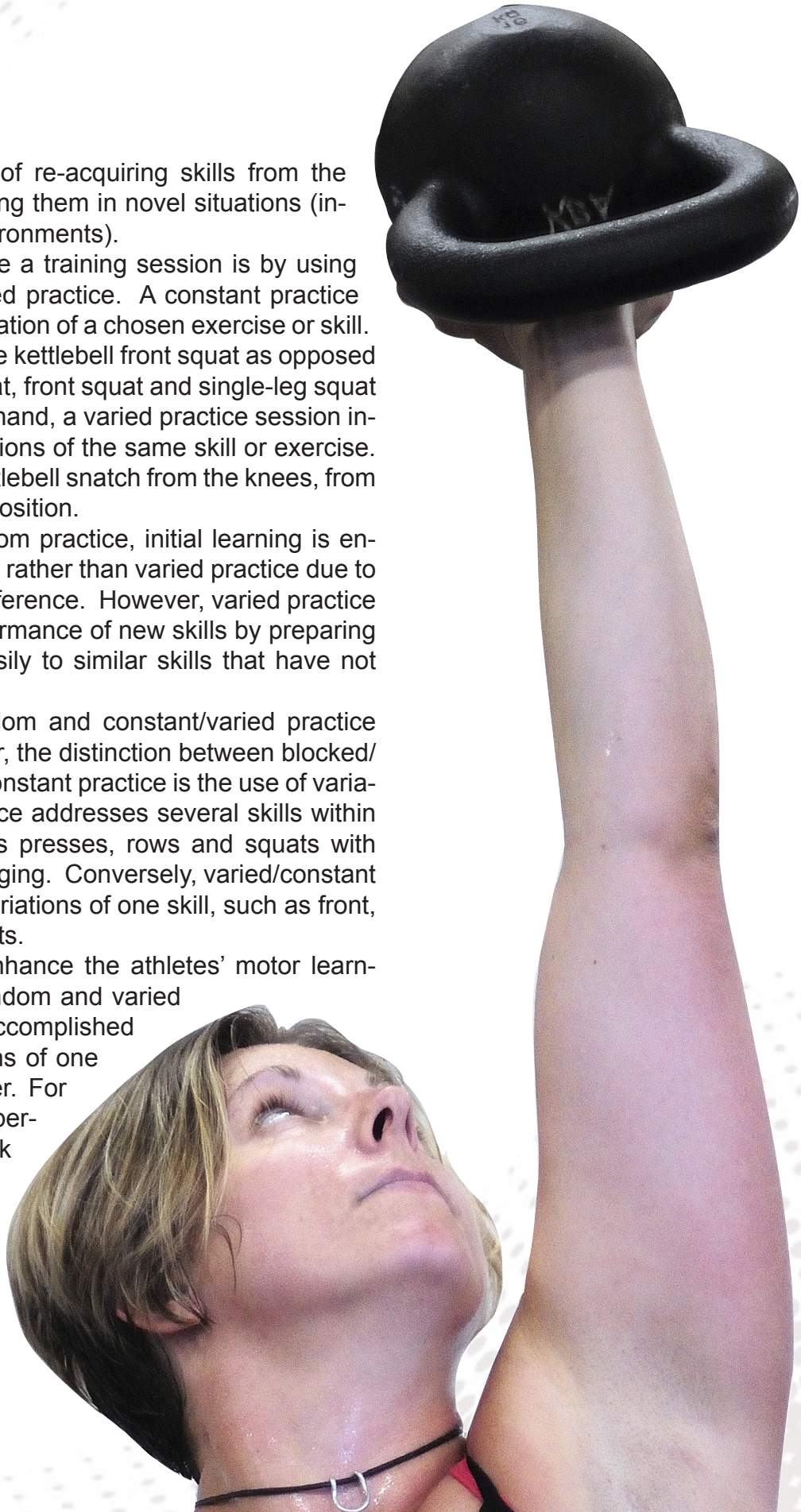
practice, defined as the act of re-acquiring skills from the long-term memory and applying them in novel situations (including competitive sport environments).

Two other ways to arrange a training session is by using a constant practice or a varied practice. A constant practice session involves only one variation of a chosen exercise or skill. For example, only teaching the kettlebell front squat as opposed to teaching the overhead squat, front squat and single-leg squat in one session. On the other hand, a varied practice session involves teaching several variations of the same skill or exercise. For example, teaching the kettlebell snatch from the knees, from the floor and from the swing position.

As with blocked and random practice, initial learning is enhanced by the use of constant rather than varied practice due to relatively less contextual interference. However, varied practice is more beneficial to the performance of new skills by preparing individuals to adapt more easily to similar skills that have not been applied previously.

Superficially, blocked/random and constant/varied practice appear quite similar. However, the distinction between blocked/random practice and varied/constant practice is the use of variations. Blocked/random practice addresses several skills within one training session, such as presses, rows and squats with only the order of the skill changing. Conversely, varied/constant practice addresses several variations of one skill, such as front, overhead and single-leg squats.

It is possible to further enhance the athletes' motor learning process by combining random and varied practice sessions. This is accomplished by assigning several variations of one drill but utilizing a random order. For example, the athlete might perform front, overhead and back squats all within one training session, mixing the drills to ensure that the same variation is not performed twice in a row. Additionally, the inclusion of a non-related skill into the training session can



further enhance motor learning. For example, the addition of an overhead press between sets of varied squats can add additional contextual interference and thereby enhance application of acquired motor skills.

By combining these different forms of practice, the athletes' overall motor learning will be greater than if only one form of practice structure is used. As with many forms of training, kettlebell training can be very complex. A part practice strategy can be utilized to divide such complex motor skills into smaller, more easily mastered component portions. As the athlete develops proficiency in new skill parts, those portions are then reintroduced and combined into a composite skill. This process is reflective of the skill set technique utilized in most all IYCA educational materials.

Part practice can be further subdivided into three types, including simplification, fractionization and segmentation. Simplification involves reducing or removing a difficult feature of a skill. For example, speed of movement, resistance, or implement size can all be reduced to decrease the challenge posed by the skill. Fractionization involves practicing two or more parts of a complex skill completely separately. For example, the athlete could practice the jerk and the clean completely independently to improve the performance of the clean and jerk lift. Segmentation involves practicing only one part of a skill until it is learned sufficiently. Once that segment is learned a second is introduced and the two are practiced together. The process of adding segments continues until the entire skill is learned.

One additional added benefit of kettlebell training is the fact than many of the training complexes utilized are unfamiliar to the developing athlete. As such, practice and training of these movements can elicit an excellent neurological benefit that can carry over into other aspects of training. By utilizing the tenets of motor learning and structuring practice sessions to optimize motor skill acquisition, the fitness professional can enhance learning over time and ultimately more positively enhance performance and prevent injury.

PROGRAM DESIGN MODEL

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PROGRAM DESIGN MODEL

The IYCA kettlebell program design model is intended to address several bio-motor skills within one training session, while movements that address one bio-motor skill have been placed within that appropriate category. Additional categories have been created and named to illustrate the prerequisite work that should be performed prior to the main portion of the training session. Although each category contains numerous movements and variations, it is impractical and unnecessary to include every exercise within each category. Instead, the fitness professional should utilize the examples provided and model new movements as necessary to add some individualization to each program.

Category A: Activation

Activating key muscles or muscle groups prior to a kettlebell training session will lead to greater performance and reduced risk for injury. Some key muscle groups to activate include the hip abductors and extensors, the mid-back group such as the middle and lower trapezius, and rhomboids.

Category B: Dynamic Warm-up

Preparing for movement with movement is a well understood principle in any modern training system. It is best to avoid static stretching and instead prepare for each training session dynamically, using large muscular movements and broad ranges of motion. These exercises are designed to activate the neuromuscular system, increase the athlete's core temperature, decrease blood viscosity, and enhance joint lubrication and nutrition.

Category C: Mostability

As defined by renowned functional movement expert Gary Gray, mostability is the combination of motion and stability. More specifically, mostability is "…the ability to functionally take advantage of just the right amount of motion at just the right joint in just the right plane in just the right direction at just the right time."

Category D: Power

The best kettlebell exercises to develop power are referred to as ballistics. Ballistic kettlebell exercises require an explosive start, little muscular tension within the midrange of the exercise and a stable and solid resting position to end. Snatches, swings and cleans are all examples of ballistic kettlebell exercises. Long rest periods, low repetitions and low fatigue best develop power. Ballistics are usually the classic kettlebell lifts or hybrid variations thereof.

Category E: Power-Endurance

As previously described, power-endurance is the ability to produce fast and powerful muscle actions over an extended period of time. Kettlebell training is well suited to develop power-endurance for two reasons. First, most kettlebell exercises are not performed slowly. Second, since kettlebells come in fixed weights, a natural way to increase demand is by increasing the number of repetitions performed within a set.

The amount of fatigue is what separates power training from power-endurance training. Power training is done in an environment of low fatigue while accelerating the weight as quickly as possible. Conversely, power-endurance training takes place within an environment of moderate to high fatigue while still maintaining a speed element to each repetition. Power-endurance is often known as conditioning or anaerobic training.

Category F: Strength

Strength is simply the ability of the neuromuscular system to produce force. Strength is best developed through the use of low repetitions, namely 1-5 repetitions per set using a weight that is 80-95% of your 1 repetition maximum. In the developing athlete, such intensity may need to be moderately decreased. However, the number of sets can vary and can be quite high, even as high as 10 sets per movement. Longer rest periods of 2-3 minutes are recommended to improve strength.

Category G: Strength-Endurance

Strength-endurance is the ability to perform muscular actions over an extended period of time. There is no speed element associated with strength-endurance training. The amount of fatigue is what separates strength training from strength-endurance training. Strength training is done in an environment of low fatigue and for low repetitions.

On the other hand, strength-endurance training takes place within in environment of moderate to high fatigue using high repetitions and/or short rest periods.

Activation	Dynamic Warm-up	Mostability	Power Development	Power-Endurance Development	Strength Development	Strength Endurance Development
Band Walks I,Y,T,W Cook Hip Lift Wall-Walks Plank Side Plank	Skipping Jogging Toy Soldiers Boot Strapper Bear Crawl Leap Frog Inch Worms Carioca Ladder Drills High Knees Shuffles	TGU Windmill Arm-bar Halo Gladiator Press	Classic KB Lifts performed for low repetitions, little fatigue. Snatches Swings Cleans Jerks Hybrids Complexes Clusters Couplets	Classic KB Lifts performed for HIGH repetitions, moderate to high fatigue. Snatches Swings Cleans Jerks Hybrids Complexes	Slower, controlled movements performed for multiple sets of low repetitions, 1-5. Squats** Deadlifts** Rows** Presses**	Slower, controlled movements performed for multiple sets of moderate to high repetitions, 10-20, moderate to high fatigue. Squats** Deadlifts** Rows** Presses**

** These exercises can/should be performed with other training tools…barbells, dumbbells, etc.

IYCA KETTLEBELL TRAINING TEMPLATES

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IYCA

IYCA KETTLEBELL TRAINING TEMPLATES

Each IYCA kettlebell training template has been created to provide a model for the sport, activity or goal represented. No single training template could or should be comprehensively prescriptive in nature because to do so would unnecessarily and arbitrarily overlook the unique needs of individual athletes. Instead, these templates have only been developed to provide selected real-world examples of the general principles outlined within this resource put into action in specific circumstances.

The safe and effective development of any kettlebell training program is based on individual monitoring of the training plan by a qualified fitness professional and an understanding of the progressions, regressions and alternatives that may be needed or preferred over the course of the training process. That said, it is critically important that the developing athlete be closely monitored before, during, and after kettlebell training in order to ensure readiness, accurate and safe motor expression, and optimal motor skill acquisition over time.

These templates and exercises illustrations from the next section will provide you with unlimited amount of combinations and formulas that can be designed and used. As mentioned in the previous section, you may have you own favorite exercise for any and all of our categories listed.

SPORT SPECIFIC TRAINING TEMPLATES

Power-Endurance Sports (Rowing, judo, MMA, wrestling, volleyball, basketball, etc.)

- Select 3-4 exercises from Category A-Activation.
- Perform 3-4 sets of each exercise.
- Select 1-2 exercises from Category B-Dynamic Warm-up.
- Perform 3-4 sets of each exercise.
- Select 1-2 exercises from category C-Mostability
- Perform 1-2 sets of each exercise.
- Select 2-3 exercises from Category E-Power-Endurance.
- Perform 8-10 sets of each exercise for high reps and very little rest.
- Select 1-2 exercises from Category G-Strength-Endurance.
- Perform 3-4 sets of each exercise for high reps and very little rest.

Power Sports
(American football, rugby, hockey, baseball)

- Select 3-4 exercises from Category A-Activation.
- Perform 3-4 sets of each exercise.
- Select 1-2 exercises from Category B-Dynamic Warm-up.
- Perform 3-4 sets of each exercise.
- Select 1-2 exercises from Category C-Mostability.
- Perform 1-2 sets of each exercise for LOW reps and ample rest.
- Select 3-4 exercises from Category D-Power.
- Perform 3-5 sets of each exercise for LOW reps and ample rest.
- Select 2-3exercises from Category F-Strength
- Perform 3-5 sets of each exercise for LOW reps and ample rest.

Endurance Sports
(Cross country skiing, swimming, track)

- Select 3-4 exercises from Category A-Activation.
- Perform 3-4 sets of each exercise.
- Select 1-2 exercises from Category B-Dynamic Warm-up.
- Perform 3-4 sets of each exercise.
- Select 1-2 exercises from Category C-Mostability.
- Perform 1-2 sets of each exercise.
- Select 3-4 exercises from Category E-Power-Endurance.
- Perform 8-10 sets of each exercise for high reps and very little rest.

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COMPLEXES & CIRCUITS

COMPLEXES & CIRCUITS

Kettlebell complexes involve a blending of several distinct movements together into one seamless drill or skill. Kettlebell complexes are an outstanding way to enhance neural plasticity/motor learning demands, metabolic conditioning, and overall training intensity. Additionally, complexes are highly time efficient, serving as an excellent way to complete incredible amounts of work in little time. There are three different ways to arrange complex training, including succession, sequence, and combination strategies.

Doing complexes in succession is the easiest way to learn. With the succession method, the athlete completes all the desired reps of one drill before moving onto the next. Alternatively, in sequence complexes, the athlete shifts from one drill directly to the other until the entire complex is finished. Lastly, in combination complexes, several drills are linked together to form one smooth drill. Combinations demand the highest level of movement skill and coordination.

Ideally, complexes should be introduced into the training program initially by beginning with two movements using either the succession or sequence method. Using the clean & press as an example, a complex designed in succession might include the completion of 5 cleans followed by the completion of five presses. Conversely, a complex designed in sequence might involve the completion of 1 clean followed by 1 press until 5 repetitions of both movements are completed. In other words, the athlete should re-clean the kettlebell on each rep. High-pulls and thrusters are classic examples of a 2 movement complex designed in combination.

As athletes become more acquainted with complex training, the number of movements within each complex may be increased. The only limitations are the fitness level of the athlete and his or her unique skill set. Additionally, several factors should be considered when designing complexes, including the athlete's ability to recall movements quickly and the athlete's systemic flexibility. Other factors to consider include the degree to which each movement flows into the next drill or skill, the complexity of each complex component, and the amount of power or explosiveness required for each complex component. These factors may necessitate some experimentation in order to ensure that the movement components of the complex are appropriately ordered in the total movement.

Taking all of these considerations into account, there are very few limitations when designing complexes. The number of drills within one complex can reach upwards of 10-15 if the athlete is able to tolerate and remember each drill and continue to express appropriate motor patterning during performance.

More On Complex Training

While one method of kettlebell complex training involves the combination of similar drills or skills together to form one seamless action, an alternative method of complex training involves

alternating exercises of heavy and light loads or slow speed exercises with drills that are performed explosively. This method of variation can be further subdivided into Russian and Bulgarian complex variants.

First, Russian complexes usually consist of two exercises and involve a slow strength movement followed by a fast strength movement. This places the emphasis on strength-speed. A common example might include a back squat for 3-5 repetitions followed by squat jumps for 8-10 repetitions. This complex would then be repeated for 2-5 sets within the training session. Alternatively, emphasis could be shifted to speed-strength by placing the faster movement first within the complex. For example, squat jumps for 8-10 repetitions would precede back squats for 3-5 repetitions.

On the other hand, Bulgarian complexes are simply combinations of more than two exercises and usually progress from the slowest exercise to the quickest. For example, back squat for 3-5 repetitions, followed by kettlebell snatch for 3-5 repetitions, squat jumps for 8-10 repetitions, and box jumps for 8-10 repetitions. Due to intensity and complexity of movement, no more than 1-3 Bulgarian complexes should be performed during one training session.

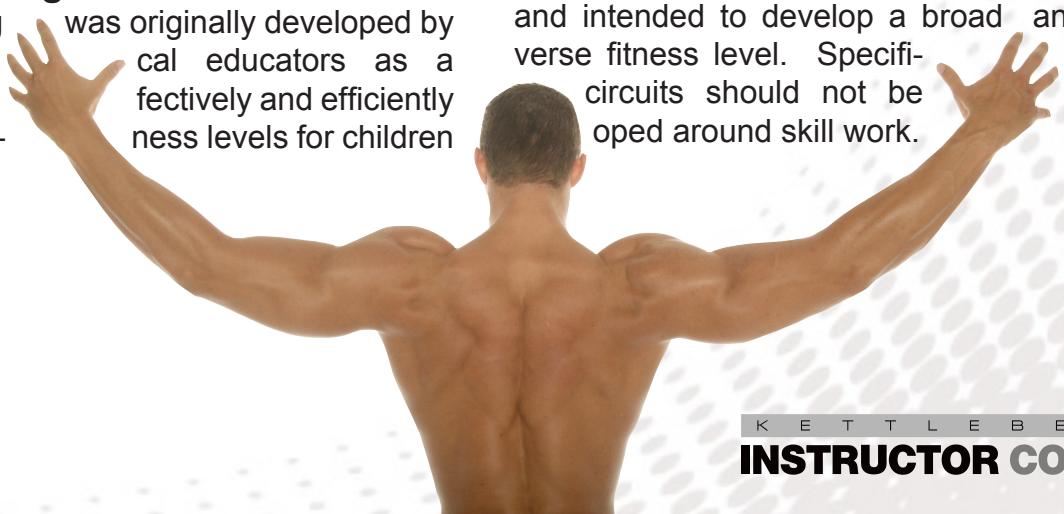
Circuit Training

Circuit training was originally developed by British physical educators as a means of effectively and efficiently improving fitness levels for children in school-based PE classes. Originally, theses circuits were designed to increase power, strength, and muscular and cardiovascular endurance. Circuit training quickly became a favorite training modality with sport coaches due to the ability to train large groups of athletes while addressing several aspects of fitness such as power and endurance.

Circuit training deals mainly with three training variables, load (weight), repetitions and time all carried out at submaximal levels. Using these three training variables, circuit training is most effectively implemented through progressive overload and periodization methods intended to steadily improve biometric capacities while preventing the onset of overtraining.

Circuits can be designed to favor any athletic quality such as speed, strength, power or endurance. When designing circuits for power or speed for example, explosive exercises performed quickly should be chosen. When designing circuits for strength, slow controlled multi-joint movements performed for low repetitions should be chosen. Circuits can also be developed with a lower body or an upper body emphasis.

Care and attention must be taken to ensure high quality of movement and proper form are maintained throughout the entire circuit. Selected exercises should be general in nature and intended to develop a broad and diverse fitness level. Specifically, circuits should not be developed around skill work.



Alternatively, it is best to develop skill within a separate training session where full attention can be given to the acquisition of that skill.

Usually, circuits are developed around 8-10 carefully chosen exercises, but that number may decrease or increase depending upon the particulars of the situation. Athletes should be able to transition from one station to the next with relative ease and little hassle. Although circuits can be designed to emphasize lower or upper body training, generally speaking, the entire body should be addressed within a circuit in order to bring about higher fitness levels.

The following represents several circuit training programs developed to illustrate the possible varieties of exercises and tools used in such programs:

Circuit Training Programs

- **Fat loss** – 1 hour. 15 minute dynamic warm-up, 5 stations-5 minutes: (a) Jump Rope; (b) Kettlebell Swing; (c) Push-up; (d) Cable Row; (e) Kettlebell C&P. 10 minute cool down, stretching.
- **Fat loss** – 1 hour. 15 minute dynamic warm-up, 5 stations- 5 minutes: (a) Agility Ladder; (b) Kettlebell Snatch; (c) Med ball Slam; (d) Double Kettlebell Thruster; (e) Pull-ups. 10 minute cool down, stretching.
- **Wrestling/Grappling:** - 1 hour.15 minute dynamic warm-up. Used to develop strength-endurance & power-endurance, 6 stations- 6 minutes: (a) Towel Chin-up; (b) Kettlebell C & J; (c) Kettlebell H2H Swings; (d) DB Incline Press (e) Cable Rotations; (f) Jumping Lunges.10 minute cool down, stretching.
- **Lean Muscle Gain:** 1 hour. 15 minute dynamic warm-up. Slow controlled exercises using multiple joints, upper body emphasis, 6 stations- 30 seconds each station: (a) DB Incline Press; (b) Weighted chin-up;(c) Weighted dips; (d) Kettlebell Bent-over Row; (e) KB C & P; (f) Cable Pulldown.
- **Tennis:** 1 hour. 15 minute dynamic warm-up. 5 stations-5 minutes: (a) Kettlebell Snatch; (b) MB Rotations; (c) Kettlebell C & J; (d) Kettlebell Threaded Lunge; (e) Kettlebell Hook Swing
- **Baseball:** 1 hour. 15 minutes dynamic warm-up. 10 stations- 3 minutes: (a) Kettlebell Snatch; (b) Kettlebell Push-Press; (c) Kettlebell Lateral Swing; (d) Lateral Bounds; (e) Kettlebell Clean; (f) Kettlebell Threaded Lunge; (g) True Kettlebell Snatch Pull; (h) H2H Swings; (i) Sling Shot; (j) Halo.

As illustrated here, it is clear to see that circuit training allows for training variety and a wide range of exercises that can be used training an individual athlete, a small group or a large class or team.

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TEAM TRAINING

TEAM TRAINING

Logically, it would seem that in order to best address the unique needs of any individual athlete, a fitness professional would be best served by working one on one to ensure that all aspects of importance for that particular athlete could be fully addressed. However, the reality is that in most instances it is far more likely that the fitness professional will be working with numerous athletes simultaneously. Fortunately, when sessions are correctly planned, such a scenario can actually be more motivating, fun, and ultimately effective than one-on-one programming. The key is in the program design, and the benefits far outweigh the drawbacks. Consider these positive factors working in favor of team-based training:

Equipment needs are minimal

Team training sessions can easily be set up in stations. With limited equipment, the fitness professional can set up stations and have a few athletes work at each station before moving to the next. Additionally, bodyweight movements can also be integrated into group training sessions, which required no equipment at all.

Variations can easily be built in and altered within the session as necessary

By choosing movements that are easily progressed or regressed, the fitness professional can incorporate a wide variety of skill levels in use simultaneously. For example, the standard push up can be regressed by kneeling and progressed with movement to clap push-ups.

Appropriately designed, numerous athletes can be monitored simultaneously

While challenging, the simultaneous supervision of multiple athletes can make sessions far more time efficient. Additionally, proficient more advanced athletes can be utilized to serve as helpful assistants to encourage and correct lesser skilled or developed teammates during the session.

Team training also adds an additional dynamic that simply cannot be found in an individualized session. In the team setting, athletes train as they play: together. This serves to build camaraderie and community and is helpful in establishing a team culture of support, motivation, and inspiration. Team training also allows for partner exercises to be incorporated into the training program, further enhancing efficiency while enhancing trust and support between teammates.