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Acknowledgements

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We thank the current USAW Coaching Education Director, Mike Conroy, who assumed that position after the early drafts of this manual had been completed, for his many photos, suggestions for improving this text, and for creating the numerous support materials that will enrich the new course. We thank Rachel Crass for contributing (and even posing for) many of the photos that appear in this manual. We also thank the other athletes who posed for the photos in this manual: Jenny Arthur, Cassi Cole, Drew Dillon, Daniel Fisher, Gamal Hassan, Zared Kile, Christopher McIntire, Frank Murray, Nathan Schadle and Martin Wintz. Finally, we thank the many USAW coaches and course instructors whose comments and suggestions helped make this manual better.
Weightlifters are the strongest and most powerful athletes in the world today, bar none. They are among the fastest and most flexible athletes in the world as well. They became that way for two primary reasons.

First, weightlifters have invented techniques for lifting that are some of the most elegant and efficient in all of sport, techniques which require great flexibility and speed. Second, and, more importantly, they have created mental and physical training methods that have enabled them to develop strength and power that is unparalleled in human history. Almost unimaginably strong, powerful and, at the same time, magnificent technicians, weightlifters represent the ultimate in athletic performance, which is why they have rightly become the objects of great interest.

What is the proof for these claims? The proof emerges from three areas: 1) the validity of Weightlifting’s tests of strength and power, 2) the objectivity of its measurement methods and 3) the open access to training and competition that the sport affords.

First, the Weightlifting events, the snatch and the clean and jerk, test to the utmost an athlete’s leg and hip strength, back strength, overhead strength, grip strength and core strength. No other strength and power tests are as comprehensive. And what could be more glorious than the end result which is a massive barbell held triumphantly overhead with no strings attached and no assistive devices used? In addition, only the maximum amount of weight lifted in a single lift counts, with no reps or holds just lift the most one time and you win.

Second, the tests themselves are objective, measurable, and reliable. An athlete stands on his or her own two feet and lifts a barbell from the ground overhead. Equipment is standardized worldwide and meticulously measured and weighed. Lifts are judged by impartial referees who apply standardized rules known to all. With the exception of ever more stringent drug controls, the rules of Weightlifting and the equipment used for it have not changed materially over the past 40 years, so performances across decades and around the world can reasonably be compared.

In addition, there are no assistive devices used in Weightlifting. For example, there are no mechanical aids, super suits, fast pools or springy tracks that are available in only one place in the world and only to those with special financial support.

Third, there is only one governing body for the sport per country, and one overall governing body worldwide with more than 180 member nations. There are not five, ten or twenty athletes all claiming to be the World Champion or world record holder in their bodyweight and gender category. There is only one. Weightlifters alone, of all the athletes competing on tests of strength, compete in the greatest test of athletic ability on earth, the Olympic Games. The winners of the Olympic Games in Weightlifting have the true right to claim the title of the world’s strongest man or woman!

Finally, accessibility to competition at the highest levels is wide open. Any lifter whose country wants to send him or her to the World Championships may do so. Therefore, access to the highest levels of competition is assured. Weightlifting has never in its proud history restricted competition on the basis of race, color, creed or any other similar non-weightlifting consideration.

What other sport, competition, or event rivals the comprehensiveness of Weightlifting’s strength and power tests, the rigor of its measurements and open access to competition? None. We claim weightlifters are the strongest and most powerful, and we can prove it. We want to add that the most elite weightlifters in the USA are drug free athletes who pursue their sport for pure love of the game. They are truly some of the greatest heroes in sport. The coaches, officials, and administrators who support them are volunteers as well, experts who are dedicated to serving the sport they love so deeply.

A Word About USA WEIGHTLIFTING (USAW) – The Sole Governing Body For Weightlifting in the USA

The USAW is recognized by the United States Olympic Committee (USOC) and the International Weightlifting Federation (IWF) as the sole governing body for the sport of Weightlifting in the United States. As such it conducts all National Championships in Weightlifting and prepares the teams to represent the USA in major international competitions such as the Olympic Games and World Championships. The mission of USA Weightlifting is to enable United States athletes to achieve sustained, competitive excellence in Olympic competition and to promote and grow the sport of Weightlifting in the United States. Therefore, we welcome the opportunity to introduce you to the process of coaching weightlifting, whether the athletes you coach wish to compete in Weightlifting competitions or simply to improve their sports performance to unparalleled levels by improving their strength and power.
Weightlifting is the Most Transformative Sport on Earth – With Some Very Unique Benefits

Most of the world’s top weightlifters were not born strong. They earned their strength and power through hard and intelligent training, often increasing their performances two to five fold, or more, from where they began. The practice of weightlifting trains the bodies and minds of its athletes more than any other sport known, literally transforming those athletes into supermen and superwomen.

Weightlifting is the only event in the Olympic Games that was specifically designed to test strength and power. The sport was included in the first modern Olympic Games in 1896. There are local, national, and international competitions in Weightlifting which are generally conducted with eight bodyweight categories for male athletes and seven bodyweight categories for women. This provides competitive opportunities for athletes of every size. In addition, Weightlifting is conducted in age categories beginning with athletes under the age of 15 and continuing up to athletes in their 80s and beyond. It is therefore possible for one to engage in Weightlifting competitions across one’s entire lifetime. No one ever “sits on the bench” in Weightlifting because everyone entered in a competition has the opportunity to perform and everyone participates equally in practices.

In addition, there is perhaps no sport that, to a greater degree than Weightlifting, provides a model of the values identified with the Olympic Games; specifically: 1) fair and non-discriminatory competitions, 2) the fostering of dreams and the fulfillment of those dreams, 3) facilitating friendship and fair play, and 4) displaying the universal joy of doing one’s best regardless of the outcome. Finally, there is no more fundamental element of fitness than strength, in terms of its ability to prepare people for all of the challenges of life. The sport of Weightlifting represents a treasure chest of strengths and values just waiting to be discovered by those who participate in it to be unlocked.

Top level athletes in the USA are drug tested perhaps more than any other athletes today. Athletes quickly learn that there is no place for those who take drugs in USA Weightlifting.

Weightlifters are special in their support of other lifters. All lifters, no matter how much they may lift, are respected by others for the effort they put forth to develop their strength, power, and technique. Regardless of who comes home with a trophy or medal, all can “win” as they demonstrate increased strength, skill, and fitness.

The Unmatched Benefits of Weightlifting Training for Weightlifting and Sports Performance

The kind of training performed by Olympic-style weightlifters not only improves their strength, power and skill enormously, but it has unmatched benefits in terms of helping athletes in other sports to develop strength and power – qualities that can be used with great benefit on their respective fields of play. No machine can develop functional strength and power in the way that lifting free weights can. But even in comparison with other free weight exercises, the events of Weightlifting, and related exercises, confer greater benefits in terms of strength and power than any other free weight exercises. Why?

Ground Based and Functional: Weightlifting is ground based and involves the kind of lifting, throwing, jumping and striking motions that characterize most sports, from baseball to football to field events, to golf and the martial arts. Weightlifters learn to generate force while standing on their feet, largely by driving explosively against the ground. This explosive motion emanates from the center or core of the body outward as the lifter executes a ‘triple extension’ with the hips, legs, and feet, to power the barbell upward. This motion is the foundation of power generation in the vast majority of sports, and the practice of weightlifting exercises contribute mightily to the development of such power generation.

Full Body Development and Time Efficiency: Because so many of the muscles of the body are trained when an athlete executes the Olympic lifts and their derivatives, the entire body is developed. As was mentioned earlier, the development occurs through functional movements which have wide application. Training multiple muscle groups at once is a great time saver for busy athletes.

Develops the “Core” and Kinesthetic Awareness Simultaneously: In order to perform their incredible lifts, weightlifters need to develop a sense of where their bodies are, where the barbell is, and how their bodies interact with the bar as both are acted on by gravity. These challenges help to heighten an athlete’s kinesthetic awareness. At the same time, lifting, throwing, catching and supporting weights overhead, or on the shoulders, develops the core muscles of the body in unison. In fact, at least one study have shown that the activity of the trunk muscles during squats and pulls from the floor is greater or equal to that produced with many common stability ball exercises.

Generates Both Hypertrophy and Neural Adaptations Which Lead to Great Increases in Strength and Power: The progressive resistance applied by weightlifters generates hypertrophy, increases in muscle fiber diameter, with
the added crucial benefit of developing strength and power concomitantly. It is unlike bodybuilding movements and repetition patterns which can develop hypertrophy that outpaces improvements in muscular function. Strength improves not only, or even primarily, as a result of hypertrophy, but also from neural adaptations such as improved intramuscular coordination, recruitment and frequency coding and improved inter muscular coordination (getting muscles to act more effectively as a group, with some muscles contracting, others simultaneously relaxing, and still others serving to support and stabilize the parts of the body that are moving).

Through training, the neurons in the brain devoted to the lifting effort (which are different from the motor neurons in the muscles) increase. There are other changes that occur in trainees, such as changes in the body’s energy delivery and circulatory systems, which can also adapt to training, and there are hormonal reactions and psychological changes that contribute to performance improvements as well, but these topics are beyond the scope of this manual. The main point to be made here is that through a very wide variety of reactions and adaptations to training, the athlete can improve his/her weightlifting and sports performance dramatically, through proper training.

Power is a measure of the rate at which work is performed, for instance, the ability to rapidly move one’s body or an external object. The following figures are based on the work of biomechanics expert Dr. John Garhammer who has extensively studied the power outputs generated in various weightlifting exercises.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Absolute Power (Watts)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100kg. Male</td>
</tr>
<tr>
<td>Bench Press</td>
<td>300</td>
</tr>
<tr>
<td>Back Squat</td>
<td>1100</td>
</tr>
<tr>
<td>Deadlift</td>
<td>1100</td>
</tr>
<tr>
<td>Snatch*</td>
<td>3000</td>
</tr>
<tr>
<td>2nd pull**</td>
<td>5500</td>
</tr>
<tr>
<td>Clean*</td>
<td>2950</td>
</tr>
<tr>
<td>2nd Pull*</td>
<td>5500</td>
</tr>
<tr>
<td>Jerk</td>
<td>5400</td>
</tr>
</tbody>
</table>

*Total pull: Lift-off until maximal vertical velocity
**2nd pull: Transition until maximal vertical barbell velocity

The above numbers demonstrate that the highest power outputs are generated in the second pull of the snatch and clean, and the drive in the jerk all of which created a power “spike” generated by applying force explosively from the “power position” (a term which will be explained later in this manual). So if an athlete wants to develop the ultimate in explosive power, training on the Olympic-style lifts provides a uniquely effective pathway.

Enhances Flexibility: Age old myths about being “muscle bound” notwithstanding, weight training performed through a full range of motion, such as those performed during the execution of weightlifting movements, actually increase flexibility. In fact, weightlifters are among the most flexible athletes in all of sport, clearly demonstrating unusual flexibility in their ankles, hips, spine, wrists, and shoulders.

Improved Ability to Promote Force Attenuation: Weightlifting does not only involve lifting and throwing heavy weights, but it involves “catching” them overhead or on one’s shoulders. Consequently, weightlifters develop the skill and physical conditioning to receive external objects such as heavy weights and bring them under control safely and efficiently.

Safety in Weightlifting – One of the Safest Strenuous Sports

While any strenuous sport presents certain risks to the participant, many are surprised to learn that Weightlifting is among the safest of all strenuous sports (see table below). This is especially true if it is performed correctly with proper supervision, sound technique, and athlete appropriate weights. Under such conditions, the occurrence of serious injury is rare. The injuries that do occur tend to be a result of improper supervision, faulty technique, or overuse — which stems from undertaking a training program that is too strenuous for the work capacity of a particular athlete and/or a particular stage in his or her training.

Through the teaching of proper technique, programming, equipment use and maintenance, the limited risk of injury will be minimal.

Sport Injury Statistics*

Injuries per 100 participant hours in school sports:
- Track and field (USA) 0.57
- Track and field (UK) 0.26
- Badminton (UK) 0.05
- Basketball (Denmark) 0.30
- Basketball (USA) 0.03
- Basketball (UK) 1.03
- Cross Country (UK) 0.37
- Fives (UK) 0.21
- Football (USA) 0.10
- Gymnastics (USA) 0.044
- Handball (Denmark) 0.41
USAW Weightlifting and Sports Performance Coach Course

Physical Education (UK) 0.18
Powerlifting (USA) 0.0027
Rugby (AUS) 1.48
Rugby (SA) 0.70
Rugby (UK) 1.92
Soccer (Denmark) 0.56
Soccer (UK) 6.20
Tennis (UK) 0.07
Tennis (USA) 0.001
Squash (UK) 0.10
Volleyball (USA) 0.0013
Weightlifting (UK) 0.0017
Weight Training (UK) 0.0035.

USA Weightlifting’s Approach to Safety in This Course

Assuring the health and safety of our athletes is one of the USAWs most fundamental and important values. As a consequence, throughout this course, we will emphasize safety. We will do this when we talk about teaching weightlifting technique, teaching the proper use of weightlifting equipment, and designing training programs. We will also emphasize safety when we teach athletes how to miss heavy weights (yes, there are very specific and effective techniques for this). We will also teach you how to “spot” another lifter (although spotting is used relatively rarely because lifters do know how to miss lifts quickly and effectively without assistance from others). We will emphasize that you never sacrifice safety for convenience, or in the quest to lift heavier weights.

Parents sometimes ask us, “Won’t my child drop a weight on her head when she is lifting?” This is understandable because they see a weight above a lifter’s head and presume that it would be a natural risk for the weight to drop and strike the head on the way down. But this very rarely occurs among athletes who have been taught to lift properly. Even if it does occur, the bar will almost inevitably brush the athlete and fall safely to the ground. In contrast to many other strenuous sports, traumatic head and spinal cord injuries are virtually unknown, in the sport of Weightlifting.

One final thought about safety. Although you will go through this course using text, video, online information and/or live teaching and demonstration of weightlifting, do not ever be afraid to refer back to this material or other similar sources of information to remind you of the finer points of what you are coaching. There is no shame in reviewing material before you implement it. The shame lies in overlooking something which could have been prevented with a review.
II. Objectives and Expected Outcomes for This Course

In addition to this section and the Introduction, there are eight basic modules in this course, along with two Appendices:

1) Weightlifting Technique
2) Assessing Readiness for Training, the Coach’s First Important Role
3) Flexibility Training
4) Basic Exercises Used in Weightlifting Training
5) Designing Training Programs
6) Effective Coaching
7) Equipment and its Proper Use
8) Preparing for Competition
   Appendix I - The Rules of Weightlifting
   Appendix II - The War Against Drugs

Upon successfully completing this course, class participants will know the fundamental elements of sound weightlifting technique and how to:
1) Emphasize safety in lifting throughout the coaching process;
2) Teach and perform the snatch, clean and jerk, power snatch, power clean, power jerk, variations of the squat, snatch and clean pulls, and overhead pressing variations;
3) Evaluate and correct movement deficiencies;
4) Develop basic training programs for beginner and intermediate athletes;
5) Apply basic biomechanical, physiological, and psychological concepts that apply to learning weightlifting;
6) Understand and explain the basic rules of Weightlifting;
7) Explain the rationale and basic methods for incorporating weightlifting movements in sports performance training programs.

Two Ways to Take the Course: Our Standard Live 2 Day Courses vs. Self-Study

This course is presented in two ways: 1) most typically through two day courses presented throughout the USA by USAW certified instructors and, 2) through self-study (an option generally selected by those who have prior experience with the sport). We strongly recommend taking a live course, as that version of the course provides an invaluable opportunity to learn and teach weightlifting progressions while being guided by experienced coaches.

However, some may not be able to attend such a course yet are highly motivated to learn weightlifting and are willing to devote considerable time to self-study. Still others will have experience in the sport (e.g., as a high level athlete or working with an experienced coach) and may already know much of the material covered by the course. Students in these categories may therefore prefer the self-study approach.

The study materials for the course consist of the manual you are currently reading and a video. The manual includes all eight of the above mentioned modules and the appendices and provides a comprehensive conceptual presentation of the course’s material. It is essential that you study this material before you attend a live course, as course attendees will be expected to be familiar with this material, especially the material in chapters 2–4, when they begin the hands-on instruction at the live course.

The second section of this course is its true core and is completely practical in nature with a hands-on approach if you are taking the course live, with an instructor physically present. By viewing the course’s video, you will be able to see an expert demonstration of the exercises referred to in the text and some hands-on teaching of less experienced lifters by a knowledgeable instructor. It is important for you to review the video prior to attending the live course, as the course instructor will assume you are familiar with the video material as well as the manual.

If you are undertaking self-study you will need to study the manual and video even more intensively in order to be prepared for the practical and written course exams.

The manual and video combined introduce a carefully structured approach to learning and teaching the Weightlifting events and related exercises. Weightlifting’s movements are fairly complex, but they are also very approachable if they are learned through a series of progressively more complex steps. This approach has proven to be
highly effective for those who are learning to perform these movements and for those who want to teach the movements. In short, virtually everyone can learn to perform the Weightlifting events correctly, and anyone who wants to teach those events can learn to do so, if he/she masters the “progressions” that will be taught in this course.

A Preview of the Approach Used in This Course

During this course, we will be explaining and demonstrating what you need to do to learn and teach the Weightlifting events, the appropriate sequence of teaching the various skill “progressions,” and what kinds of training programs new and intermediate level athletes should follow. You will also learn some of the whys of weightlifting, along with the biomechanical, physiological and psychological underpinnings of weightlifting technique and training.

In most cases, as we present the basic exercises and progressions that are used to teach weightlifting, we will use the following format:

1) Secure the appropriate equipment to perform the progression and be sure that you know how to use it safely and effectively;

2) Assess the athlete’s ability to perform that progression and learn how to help that athlete achieve readiness, if he/she is not yet ready to perform the progression;

3) Demonstrate and explain the progression and its purpose, and discuss appropriate safety considerations;

4) Assess the athlete’s performance of the progression;

5) Make any appropriate corrections in the athlete’s movement patterns, amount being lifted, focus or equipment, to facilitate proper learning of the progression.

Once the above steps have been completed (in day one of the live course), you will be expected to replicate this process as you become the (supervised) instructor on day two. This approach will help you learn how to train a new athlete with safety and effectiveness, to assure the opportunity for long term high performance on the part of that athlete, by avoiding the main impediments to high performance, such as learning faulty technique and overstressing the bodies of beginning athletes.

We urge you to carefully follow all the instructions provided in this course as you train your athletes. Experienced coaches understand when it is appropriate to modify or even skip a step, but new coaches are encouraged to follow every step until they are well skilled in applying the material they have learned in the course, and have observed athlete reactions to the progressions and programs recommended.

Assessing Your Grasp of the Course Material

Your grasp of the material presented in the course will be assessed through a practical exam and a written one.

Those who take the two day course will be assessed by their instructors during or near the end of the course on their understanding and application of the progressions. The instructor will observe as you perform the progressions and as you “teach” others to do so. If you have taken the self-study version of this course, you will be assessed by a proctor on your ability to perform and teach the progressions.

Regardless of whether you have taken the course through self-study live, you will take a written exam on the material that was presented in the course. That exam will have a mixture of assessment tools i.e., multiple choice questions and fill-ins.

Students will be graded on the practical and written exams and must demonstrate proficiency in both in order to satisfy the course requirements and be certified as a USA Weightlifting and Sports Performance Coach. For an additional fee, those who are unable to satisfy course requirements the first time they take the course will be able to retake the course or carry out additional self-study by retaking the part(s) of the exam they did not pass the first time around.

Some Final Remarks

In closing this chapter of the manual, we want to say that it is our privilege to introduce you to the glorious and miraculous sport of Weightlifting and to help you to unlock its secrets and unique benefits. If at the end of the course you have learned enough to teach others some of the grandeur that is Olympic-style Weightlifting, we will be most grateful.

After completing the course, if you go on to choose to continue a journey that includes Weightlifting as a great love of your life, as so many who are involved in the sport have done, we can assure you that your choice will afford you many rewards, the greatest of which may be to help make the young men and women of America stronger, both mentally and physically. It is to those of you who choose this path that the future of American Weightlifting belongs. Please work to bring it the bright future that it so richly deserves. Now let us begin.
Good Weightlifting Technique is Incredibly Effective, Yet Counterintuitive

In the sport of Weightlifting, we have one primary objective. It is to lift the maximum amount of weight overhead within the rules of the sport and, once the weight has been lifted and the body is standing fully erect, to demonstrate that the weight is under control, by holding it overhead with the barbell and the body of the athlete motionless. That sounds simple, and on many levels it is, if one bears in mind some basic principles that apply to the snatch, to the clean, and to the jerk.

Contrary to what most people think when they observe weightlifting in a cursory manner, weightlifters do not simply grip the barbell and rip it from the floor overhead. As weightlifters have learned after many decades of trial and error, and scientific study, there is a much better way to lift maximum weights overhead. It is done by using the strongest and most powerful muscles in the body efficiently, which involves a three step process:

1) Get the barbell to a position where the athlete can generate the greatest force against it. Those who are new to the sport are often surprised to learn that, this position is not with the barbell on the floor, but rather a position referred to as the “power position”, a position where the bar is in contact with the body, the legs are partially bent, and the torso is essentially upright;

2) Generate maximal force at the highest possible speed when the barbell has reached that power position, by using the most powerful muscles in the body, which are those of the legs and hips, to lift or “throw” the barbell upward;

3) Catch the barbell effectively overhead, in the snatch and jerk, or on the shoulders in the clean, then rapidly brake the barbell’s downward progress; finally, “recover” by standing up to the finished, erect position.

After reading the three steps above you might ask “But what about the muscles of the arms and back – aren’t they doing the lifting too?” The answer is yes, but their work is subordinate to the work of the muscles of the legs and hips and the arms and back do not work in the way most people think when they first see a lift being done. Let us explain.

III. Weightlifting Technique

Strongmen began to understand the strongest positions of the human body more than a century ago as they developed such lifts as the “back lift,” the “harness lift,” and the “hand and thigh lift.” All of these lifts involved the use of the legs and hips in their strongest (nearly straight) position, because the muscles of the arms and back do not come close to those of the legs and hips in terms of their ability to generate force. Therefore the arms and back were not materially used in these exercises, in which the old time strongmen actually lifted literally thousands of pounds.

Modern weightlifters, whose ability is measured by the amount they can lift over their heads, soon learned that they too could lift the highest weights overhead by intelligently using the muscles of the legs and hips to propel weights upward from the aforementioned “power position.” Again, this is the position where the legs are partially bent, the torso is nearly or completely upright, and the barbell is in direct contact with the thighs or shoulders.

So in many ways the nearly supernatural lifts performed by the strongest modern weightlifters, who can snatch nearly 500 lb. and clean and jerk nearly 600 lb., result from a combination of the unmatched strength and power of those athletes, which have been developed through very advanced and specialized strength/power training techniques, and from using techniques that result from learning how to place the bar and body in the power position, then exert tremendous upward force against the barbell and then catch the bar on the shoulders or overhead.

In order to better understand the “what” and “why” of the technique teaching methods you will be learning in this course, it is helpful to begin with studying what high level athletes actually do when they execute the snatch, the clean and the jerk. Such study is assisted by examining these lifts as they progress, step by step, through a series of sequence photos, and then observing as the lifts are performed at competition speed in the accompanying video or live.
A Basic Analysis of the Technique Used in the Competition Lifts

Many volumes have been devoted to the study of weightlifting technique. In this course, we will refer only to the key fundamentals of technique, leaving the finer and less important points to other levels of study. But our analysis will not oversimplify or present half-truths; it will simply present the essentials that you can use to teach technique. These are essentials that will form a firm foundation for future study and practice of technique. The analysis will begin with a review of a sequence of paired photos of the snatch and clean being done in competition (the snatch will always be the top one of the pair).

The Start Position: The two athletes shown prepare to lift the bar from the platform in the snatch and clean with the following similarities in their positions (which are somewhat different because of the differences in the width of the grip for the snatch and clean):

1) Feet are positioned approximately at hip width and the bar is placed directly above the base of the toes (the juncture of the toes and the feet); the toes are generally turned out somewhat, so that they are moderately wider than the heels;

2) Shoulders are directly above the bar or slightly forward of it (never behind) and the shoulders are also above the hips, while the hips are lightly to moderately above the knees;

3) Shins are leaning forward and are very close to the bar or lightly brushing it, and the lifter’s balance is toward the middle of the feet or slightly forward of the middle;

4) Arms are straight and relaxed with the crooks, the insides, of the elbows facing the torso

It can be seen that in the snatch, as compared with the clean, the torso is inclined forward from an upright position to a greater extent, the legs are bent to a greater extent and the hips are lower because the wider grip in the snatch brings the shoulders closer to the bar than they are in the clean.
The Barbell at Knee Level: When lifting the barbell from the floor to knee level, it is generally lifted smoothly from the floor with the:

1) Shoulders and hips rising together, the bar being lifted to knee height solely by the legs (angle of the torso relative to the floor remains the same throughout the lifting of the bar from the floor to the knees);

2) Shins moving to a completely upright or vertical position, as the legs alone raise the bar from floor to knee level or just above by partially extending the legs without straightening the torso with the balance shifting toward the middle of the foot or beginning of the heel; and the feet remain flat on the floor,

3) Bar travelling slightly backward toward the lifter so that it is over the instep as it reaches the height of the knees, causing the shoulders, which have travelled upward at the same rate as the hips and sometimes forward as well, to now be positioned in front of the bar more so than at the start;

4) Arms remain straight and the arm muscles relaxed and trapezius muscles remain relaxed but pulled “taut” by the weight of the bar.

Point 2 above is particularly important, since many new lifters try to lift the bar around the knees instead of allowing the knees to shift back, out of the legs partially straighten.

The Power Position: As, or a little after, the bar passes the knees the:

1) Torso moves rapidly to a near upright or upright position while the hips extend and the bar scrapes along the thighs, the knees and hips move forward and down until the bar reaches the tops of the thighs in the snatch and mid to upper thigh in the clean;

2) Legs remain bent or bend further as the torso is straightened; but they do not straighten;

3) Bar is over the middle of the foot, as is the lifter's balance, with the feet generally flat on the floor;

4) Muscles of the arms remain relaxed, so that the arms are pulled taut by the barbell and the trapezius muscles remain relaxed and the athlete has achieved the all-important “power position” referred to earlier. In contrast to what happened when the bar was raised from the floor to the knees where the legs and hips were solely responsible for the upward motion of the bar from the knees to the power position, it is the action of the hamstrings and hip extensors that have straightened the torso while the legs remain bent or bend further into this power position.

Note: In the snatch power position the bar is generally at the juncture of the thigh and hip while in the clean it is generally between mid-thigh and the upper third of the thigh.
The Explosive Extension of the Body: Once the bar reaches the power position, the lifter explodes upward to generate the highest levels of power that occur during the lift, and in all of sport, generating the power spike referred to earlier by the:

1) Full extension of the legs and hips and generally and subsequently the ankles while a powerful effort is made to shrug the shoulders (although there is little actual raising of the shoulders until the lifter begins to move under the bar by bending the legs);

2) Arms remain straight, hanging onto the bar like ropes with the hands securely gripping the bar, connecting the bar, along with the direct contact of the bar with the legs, to a powerful upward explosion of the legs.

3) Torso remains upright or may lean slightly back as the hips travel primarily upward, although they may travel slightly forward, however the less the better and the hips must never go forward of the toes;

4) Powerful force generated through this explosive motion, which is sometimes likened to a throw or a jump, propels the bar upward as happens when a jump is performed; the legs drive the body and the bar upward with maximal speed and force. However, unlike a jump, there is no effort to raise the body far off the platform because the feet generally skip outward slightly after the explosive effort is applied to the bar as the lifter repositions the feet to receive the bar on the shoulders or overhead. Similar to a throwing motion, an effort is made to import maximum speed to the barbell. Unlike a throw, there is no effort to follow through by remaining in the extended end of the throw position because the critical “catching” phase of the lift follows immediately after the explosive effort against the bar is taking place; in fact, it actually begins at the end of the explosion.

The Beginning of the Rapid Descent Under the Barbell: After having reached the fully extended position, the athlete instantaneously bends the legs to move under the bar with utmost speed. To facilitate this, the trapezius muscles are shrugging the shoulders upward explosively and the arms are beginning to bend, to pull the lifter downward under the bar.
Catching the Bar in the Receiving Position in the Snatch: The lifter explodes downward underneath the bar by rapidly dropping the hips down and pulling himself under the bar with the trapezius muscles and arms, then by pushing upward against the bar to lock the bar at arm’s length in the snatch, and turning the elbows around the bar to rack the bar on the shoulders in the clean with the elbows at the level of the shoulders.

Lowering the Body Into the Full Squat Position and Braking the Downward Motion of the Barbell: The lifter has descended into the low squat position while working to rapidly tighten the torso and to:

1) keep the elbows up in the clean or hold the arms locked in the snatch;
2) amortize or absorb the downward pressure from the bar with the legs to arrest the downward motion of the bar.

Ideally, in the clean in particular, the lifter will quickly begin the recovery from the low squat position after the downward movement of the bar has been arrested to exploit the elastic qualities of the leg muscles that have been stretched into the full squat position.
The finished Position: Here the lifter has stood up to the fully erect position with bar overhead by:

1) Straightening the legs while keeping the arms in a locked position overhead (in the snatch) or remaining upright and keeping the elbows up (in the clean), while standing to a fully erect position from the low squat. At the end of the recovery to the standing position in the clean, some lifters extend the legs more quickly to drive the bar very slightly off the shoulders, then catching it on the shoulders again. This is done in order to unload the torso, so that they can get their chests up as much as possible and reposition the bar more comfortably on the shoulders after the clean, in preparation for the jerk,

2) The lifter is careful to bring the torso, the bar, and the feet in line and becomes motionless to await a signal to put the bar down (in the snatch), or begin the jerk (after the clean has been completed).
The Jerk

Having analyzed the actions of the lifter and movement of the bar during the snatch and clean, we will perform a similar analysis of the jerk. The jerk may appear at the outset to be very different from the snatch and clean, but in reality and of necessity, a number of the same motions and principles employed in the snatch and the clean apply in the execution of the jerk as well.

Jerk Start Position

After the clean the lifter assumes the starting position for the jerk where the:

1) Bar rests primarily on the shoulders above the clavicles (collar bones) and in the palms of the hands, which are facing upward, while the thumbs wrap around the bar from front to back with the rest of the fingers going from back to front;

2) Arms are relaxed and fully bent with the elbows held at shoulder height or below,

3) Lungs are inflated to lift the chest with the torso rigid,

4) Balance is toward the lifter’s heels.

Jerk Dip

Once the correct starting position has been assumed and the lifter has been motionless for at least an instant the:

1) Knees move forward and down directly over the toes, while the hips move straight down under the bar (which crucially moves straight downward as well),

2) Trunk is held rigid and strictly vertical with the lifter’s balance continuing to be toward the heels;

3) Bending of the legs proceeds at a moderate pace neither rapidly nor slowly until the bar has travelled downward by approximately 8 to 12% of the height of the lifter;

4) Downward motion stops crisply with the bar remaining firmly in contact with the shoulders and the lifter in the “power position.”

Jerk Drive

From the power position the:

1) Lifter explodes upward against the bar by pushing against the floor and extending the legs, and there is generally a slight upward rise on the toes;

2) Balance shifts toward the middle of the feet, and the legs are extended (the bar is in contact with the shoulders throughout this driving process, which ends as soon as the legs have fully extended,

3) At this point the lifter begins to immediately move under the bar; there is no hesitation in the legs extended position but rather the lifter moves instantaneously downward under the bar as soon as the legs have reached their extended position.
**Jerk Split & Catch**

In order to reach this position the:

1) Feet move just above the surface of the platform and land crisply well before the lifter has finished moving downward. The back foot moves slightly earlier and lands slightly earlier than the front foot;

2) Arms are pushing up against the bar driving the lifter downward under the bar while working to reach a quick and solid lockout of the elbows; in the top photo on the left, the feet have been repositioned and the lifter is driving up against the bar with the hands, to drive the body downward while maintaining upward pressure on the bar; in the second photo the arms have finished driving while the shoulders remain athletically relaxed in supporting the arms solidly overhead, but they are mobile enough to adjust their position forward or backward;

3) Hips move directly down under the bar or slightly forward, but never backward, while the torso remains vertical or leans slightly forward but never backward;

4) Legs are bending as soon as the feet land on the platform and are athletically relaxed in bending to the depth necessary for the lifter to lock the elbows solidly with the bar directly above the shoulders and hips or slightly behind;

5) Shin of the front leg is vertical and the front foot is flat; The feet are positioned to run straight forward and back by being nearly perpendicular to the bar or the front of the foot is slightly turned in (the front of the foot is never turned out) while the back foot contacts the platform with the toes and ball of the foot. The heel of the back foot is raised and is turned in somewhat, with the outside of the heel slightly outside of the toe.

**Jerk Recovery – Standing Up from the Split Position**

Once the lifter has stopped the downward movement of the bar in the full split position the:

1) barbell, shoulders, and hips are maintained in vertical alignment while the lifter extends the front leg partially and then brings the front foot backward one step;

2) legs extend further and the back foot is brought forward one step, which generally places it directly under the hips, shoulders, and barbell, so that the barbell, torso, and feet are all parallel and in line from side to side;

3) elbows remain rigidly locked throughout this recovery process;

4) lifter becomes motionless and waits for the referees’ signal that the lift has been completed.
Trajectory – Motion of the Bar Viewed From the Side

We have already mentioned a few aspects of the motion of the bar during the lift, but a few more points regarding the bar’s pattern of movement or “trajectory” are worth making. If you are observing a lifter from the front or back during the execution of a lift, the bar should always be level with neither side higher or lower than the other. As a coach, it is important for you to view the lifts of your athletes from the front or back periodically to help assure that this evenness is taking place and to determine that the athlete is not making any technical mistakes, such as pressing out the bar overhead in the snatch and touching the elbows to the knees in the clean, or committing other infractions of the rules which will be discussed later in this manual.

Ideally, most coaches would prefer to view a lift directly from the side of the lifter as that position generally provides the greatest amount of information about the athlete’s most critical movements and critical movements of the barbell. Unfortunately, there is a problem with this approach. If an athlete is viewed directly from the side, the large (45cm) diameter plates block the coach’s view of some of the most important movements a lifter makes, as well as a view of the relationship of the lifter to the bar. Therefore, most coaches actually view most of the lifts of their athletes diagonally, at about a 45 degree angle from the side and rear or side and front, as these are the single positions that provide the coach with the greatest amount of information regarding an athlete’s technique given the diameter of the plates, by affording the coach the opportunity to observe the movement of the body forward back and vertically along with the trajectory of the bar in the same dimensions.

When it comes to bar trajectory, what coaches typically look for is a standard trajectory, which involves the bar travelling slightly backward (never forward) toward the lifter while the bar moves from the floor to the knees and then continues to move back toward the lifter while the lifter is beginning to drive the knees and hips forward toward the bar, until the knees are well in front of the bar and the lifter’s legs make solid contact with the bar (at approximately mid-thigh in the clean and the tops of the thighs in the snatch). Beginning at this point, the bar begins to travel slightly forward as the lifter finishes his/her upward explosion from the power position by fully extending the legs and hips with some rising on the toes. The bar continues to curve forward as the lifter descends under the bar, but then it begins to curve back again in a loop as the bar reaches its maximum height and begins to drop back down and backward toward the lifter (see diagram (a) above). It should be noted that throughout this process the bar scrapes along or is at least extremely close to the thighs. Overall, when a lift is viewed from the lifter’s left side, the bar will move in a pattern similar to a somewhat flattened (except in the jerk, where the bar’s trajectory is almost straight — see (d) above) letter “S”, that has a slight backward lean.

Bar trajectories vary from athlete to athlete, and some high level athletes actually throw the bar forward (see (c) above) or backward (see (b) above) during the explosion phase, so much so that they need to jump noticeably forward or back as they move under the bar, thus ensuring that they will be beneath the bar when it begins to descend. These kinds of motions should be discouraged in beginning lifters, as most beginners should learn the standard technique before venturing out to try more atypical techniques of less proven value.

The Tempo of Bar Movement

At this point it would be useful for readers to view the video that accompanies this manual, so they can see a snatch and clean done in slow motion and at competition speed. When viewing the lifts being done at competition speed, you will notice that the bar is lifted smoothly from the floor; it slows down almost imperceptibly as the bar passes the knees while they move forward of the bar before the explosion that accelerates the bar upward and gives the athlete the chance to move under the bar, while the barbell continues to go up because of the upward momentum of the bar that is created by the explosion.
IV. Assessing Readiness For Lifting – The Coach’s First Important Role

**Early Training Must Be Structured - Yet Adapted To the Individual**

Virtually all beginners will have to go through certain steps to learn the competition lifts and related exercises, and those steps cannot generally be skipped. On the other hand, no two beginners are alike. Apart from apparent differences with respect to characteristics like gender and size, they also differ with respect to such crucial areas as general health, sport specific health, conditioning level, prior experience with weight training, and flexibility. Therefore, a structured pre-training assessment with regard to these characteristics should be performed by the coach on each athlete, so that the appropriate entry point into weightlifting training for that particular athlete can be determined.

**The Health Assessment**

Before an athlete begins training, that athlete should be cleared by a medical professional to perform strenuous exercise in general and weightlifting in particular. While almost anyone can train to become a weightlifter, certain acute and chronic conditions preclude this. For instance, a person who has just torn his/her ACL may well be able to compete in Weightlifting once the ACL has been repaired and rehabilitated, but not before that. Similarly, a person with a herniated disc is not ready to begin training until and unless that injury has been satisfactorily addressed, and perhaps not at all if such an injury is not fully resolved by treatment.

**Prior Training History**

Once medical clearance has been obtained, and minors have been granted written parental permission to participate, the athlete should be evaluated for his/her familiarity with any weightlifting exercises. This is important because the athlete who has been doing power cleans and squats (exercises that will be explained later in this manual) will be able to begin their training at a different level than beginners who have never lifted a barbell before.

For instance, the beginner with no prior history of free weight training may need to begin all exercises with just a bar or stick while the more experienced athlete may be able to start with more weight, especially in exercises that do not involve a great deal of skill, such as squats and presses. On the other hand, the more “experienced” beginners may have been performing a certain exercise so incorrectly that it will take them longer to learn the correct exercise technique than someone who has never performed that exercise.

Therefore, the new lifter with prior experience should be asked to demonstrate the relevant exercises he/she has been performing. These would be exercises that are part of the basic exercises new athletes will be using to learn how to perform the snatch, clean, and jerk, such as the power clean and power snatch and any form of squatting or overhead lifting (e.g., front squats, back squats, push presses or military presses – exercises that will be explained later in this manual). If the athlete has no familiarity with these exercises, the coach should simply move on to the critical flexibility assessments we are about to discuss because any weight training background the beginner has will likely not have much carryover value to weightlifting as a sport.

**Flexibility Assessments**

The sport of Weightlifting requires considerable flexibility. Relatively few new lifters possess the flexibility needed to perform all of the exercises that will be used in training, especially the squat, snatch, clean, and the jerk. That is why weightlifting specific flexibility must be assessed before any training can begin.

Once the flexibility assessments have been performed, the coach can decide whether the normal teaching progressions suggested in this manual can be followed, or whether some adjustment in these progressions is required. For instance, many coaches prefer to begin with teaching a new lifter the clean before the snatch. While this is completely optional, as either the clean or the snatch can be taught first with good success, an athlete who is unable to hold bar comfortably on his/her shoulders in front of the neck is not ready to learn the clean. That lack of flexibility must be cured before cleans can be attempted because cleaning with inadequate flexibility precludes the use of proper technique and exposes the athlete to the possibility of injury.

**Four Fundamental Flexibility Assessments and Some Extras**

Four simple tests can be used to assess whether a new lifter has the requisite flexibility to begin practicing the competition lifts with maximal opportunity for success and minimal risk of injury. They are the front squat, overhead squat, snatch grip deadlift, and military press.
Assessment 1 – Front Squat

This exercise will help you to determine whether an athlete has the requisite flexibility in the muscles and joints of the hips and legs to assume a correct full squat position, and the flexibility in the arms and shoulders to support a bar comfortably on his/her shoulders in front of the neck. A lack of sufficient flexibility does not mean the athlete cannot learn to lift. It simply means that athlete cannot perform cleans at all if they lack the arm flexibility that is required, and they cannot do squat cleans if they lack flexibility in the legs or hips.

To begin the front squat assessment, the lifter grips a broomstick or empty lifting bar (no plates loaded) with the hands just outside the shoulders. The bar is supported by the shoulders, which are slightly raised. The bar may also touch the clavicles (the collar bones) but they are not primarily supported by them. The palms of the hands are also in contact with the bar, with the fingers encircling the bar from rear to front and the thumb from front to rear. The feet are positioned approximately hip width apart, with the toes pointing out somewhat. The entire foot is flat on the floor (see photo (a)).

Keeping the torso vertical and held in the universal weightlifting posture, the lifter bends the legs with the knees traveling in line with, but forward of, the toes as the legs bend (see photo (b)). The lifter continues to lower the body into a full squat position. The lifter squats as low as possible, ideally until the backs of the thighs contact the calves while the elbows are kept at approximately the same height as the shoulders. The torso is held as close to vertical as possible, in the universal weightlifting posture with the upper back flattened and the lower back arched. See photo (c) below for an example of a good bottom position. The photo shows a lifter with sufficient flexibility in the arms, legs, and hips to assume a correct full front squat position. This lifter is ready to begin to learn to perform front squats with weight, as well as power cleans and ultimately, squat cleans. It should be noted that if the lifter is using a stick versus a bar or light weight, the lifter (especially larger athletes) may find it more difficult to keep the bar on the shoulders and reach the depth of the squat position shown. As long as the lifter can simply hold a bar with 5 or 10 kilo plates on either side correctly on the shoulders, without squatting down, flexibility in the arms and shoulders is sufficient for the athlete to begin to learn to power clean. Important reminder — the model is shown here with a loaded barbell but the assessment is performed with a stick or bar with no plates on it.

Photo (d) shows a lifter who lacks adequate flexibility in the legs and hips and cannot hit a full squat position with the torso vertical and in the correct posture with the legs fully bent, so that the thighs touch the calves. But this lifter’s arms appear to be flexible enough to shoulder or “rack” the bar correctly. Such a lifter needs to improve the flexibility of his legs and hips. There are a variety of flexibility exercises that will help in this regard. Perhaps the most specific and effective is the squat stretch and its varieties, which are described in the flexibility training section of this manual.

Photo (e) shows a lifter whose legs and hips are flexible enough but whose arms are not, since the lifter cannot bend the arms enough for the bar to be fully supported on the shoulders while lightly brushing the front of the neck and his elbows are too low (far below the level of the shoulders). If the bar slips to the fingers or even off the fingers, as opposed to being held in the palms, or if the elbows cannot be held near the level of the shoulders, or if the bar cannot be lowered to contact the shoulders, the lifter will need at least some flexibility work on wrists, rear shoulders, and elbows. There are a number of flexibility exercises that can help improve flexibility in these areas, but the elbow stretch described in the flexibility section of this manual will be of particular help.
Assessment 2 - Overhead Squat

The lifter begins with the athlete in a standing position with a broomstick, dowel rod, or PVC pipe held above his/her shoulders and the elbows fully locked. The grip should be as wide as possible with the bar still being a couple of inches above the lifter’s head. The athlete grips the bar with the bar in the palms of the hands, the wrists back, the fingers encircling the bar from rear to front, and the thumbs encircling the bar from front to rear. The feet are hip width apart, or slightly wider, with the toes turned out somewhat (see photo (a)).

The lifter bends the knees to squat down with the knees travelling forward over the toes (see photo (b)), while the lifter maintains an upright torso. The lifter ultimately reaches the full squat position shown in photo (c) (Reminder: the lifter in the photo is using a loaded bar but the assessment is done with a stick or empty bar).

Photo (d) shows a lifter who lacks adequate flexibility in the legs and hips and cannot attain a full squat position with the torso vertical and the legs fully bent, so that the thighs touch the calves. However, this lifter’s shoulders and wrists are flexible enough to position the bar overhead correctly. Such a lifter needs to improve the flexibility of his legs and hips. There are a variety of flexibility exercises that will help in this regard. Perhaps the most specific and effective is the squat stretch and its varieties, which are described in the flexibility section of this manual.

Photo (e) shows a lifter whose legs and hips are flexible enough to perform a correct overhead squat, but whose shoulders and wrists are inflexible and that lifter is unable to get the bar directly above or slightly behind the shoulders. Such a lifter will need flexibility work on the shoulders and wrists. The former can be improved through practicing a number of flexibility exercises, but perhaps the most effective one is shoulder dislocates which do not, of course, actually involve dislocating the shoulders and snatch grip squat stretches, which will be explained later in this manual.

You will note that in photos (a-c) the crooks (insides) of the athlete’s elbows are facing mostly upwards. For lifters who have difficulty getting the bar back into the correct position overhead with the elbows held in this position, and even for those who do not, an alternative that many find useful is to position with the crooks of the elbows so that they are pointing forward instead of up. This position permits the shoulders of most athletes to move more freely and allows for more lean forward of the torso than the typical, crooks of the elbows up position. Another advantage of the alternative elbow position is that it helps lifter with poor arm lock to place less stress on the elbows and triceps muscles in holding the bar overhead. Although not the most popular position, it has been used with great success by many athletes including Antonio Krastev of Bulgaria, the man who snatched the heaviest weight ever recorded in international Weightlifting competition (216 kg.), so it is clearly a strong and effective position (see photo f).

It should be noted that some lifters who have trouble executing a correct front squat are able to perform a good overhead squat or vice versa. Other lifters will have difficulty with both varieties of squats and will not be able to lower the body even into a half squat because of discomfort in the wrists, arms, and/or shoulders. For, such lifters, there is an alternative test of pure leg and hip flexibility that can be employed.
Alternate Squatting Test – The Olympic-style Back Squat

As was indicated earlier, some athletes who do not have the ability to assume the correct front or overhead squat position because of a lack of mobility in the arms or shoulders may have adequate flexibility in their legs and hips in order to squat. Such lifters generally perform back squats while they work on gaining the necessary mobility to perform front and overhead squats. A correct back squat position is shown in photo A and an incorrect position is shown in photo B. The lifter, who cannot perform any version of the squat correctly, needs to work on flexibility in the legs and hips (see the Flexibility Training section of this manual for further details).

Assessment 3 – Snatch Deadlift

A third exercise that should be used to assess readiness for weightlifting training is the snatch grip deadlift. Here the coach’s assessment focuses on whether or not the lifter, with a snatch (wide) grip like the one used in the overhead squat that was already illustrated, can assume the correct position to take the bar from the floor. This means the lifter is able to grasp the bar with the arms straight, the lower back arched and the shoulders, bar, and base of the toes all in vertical alignment, or the center of the shoulders slightly in front of the bar. The shoulders should also be above the hips and the hips slightly to moderately above the knees when the bar actually leaves the floor. Photo C depicts a correct starting position and photo D an incorrect position. If a lifter is not able to assume a correct starting position for the snatch, then he/she is certainly not ready to perform a power snatch or snatch from the floor. Such lifters must work on hip and leg flexibility. There are many exercises that can help a lifter improve flexibility in these areas, but descending deadlifts and start positioning with real-time feedback may be the most helpful. These and other exercises will be covered in the flexibility training section of this manual.
Alternate Assessment – The Clean Deadlift

Athletes who are not sufficiently flexible to assume a correct position for a snatch deadlift may be able to assume a correct position for a clean deadlift, because of the narrower grip which permits the hips and shoulders to be placed higher relative to the bar that the snatch deadlift does. Therefore, if an athlete fails the snatch deadlift test, it is appropriate to test the clean deadlift position. If the athlete cannot assume the correct position to start a clean deadlift, such as the one shown to the right, further stretching will be needed before power cleans and cleans from the floor can be learned.

Assessment 4 - Military Press

The military pressing exercise simulates the bar’s path and finishing position of the jerk, so it is a useful test to determine whether a lifter has sufficient flexibility in his/her shoulders to begin practicing jerking and related exercises.

In the military press exercise the lifter lifts or presses a bar or stick overhead with the arms until the elbows are fully locked and the bar/stick is positioned to the rear of the lifter’s head and directly above or slightly behind the shoulder joint (the knees are locked and the leg and hip muscles are kept tight during the pressing motion). The athlete should be comfortable in this position with a shoulder width grip, as is shown in the photo of the finished position in the military press at the right.

If an athlete has insufficient flexibility to assume this correct finished position and instead assumes a position similar to the incorrect one shown on the right, the problem can be remedied by a number of means, and the dislocate exercise mentioned in connection with the overhead squat is one. But a more specific exercise is assuming a split or partial squat with the hands on the bar at approximately the width of the shoulders, supporting the barbell at arms’ length. This is practiced, until the lifter is very comfortable in such a position. This exercise will be demonstrated later on in this course.

For lifters with very tight shoulders, using a wider grip and turning the crooks of the elbows to a forward facing position may be helpful. This is a similar position to the alternative elbow position that was described earlier for the snatch, except that because of the narrower grip in the jerk the crooks of the elbows cannot be turned forward as much.

How a Lack of Flexibility Affects the Technique Learning Process

If a lifter shows insufficient flexibility in any of the assessments described above, he/she must not only do the appropriate flexibility exercises, but also must refrain from attempting to learn the exercises referenced in the preceding sections. This will affect the training programs for such athletes, precluding some of the learning progressions that will be explained later in this manual, until the requisite flexibility is attained, as well as the initial program that the athletes undertakes at the outset of training. Therefore, a modification in the athlete’s training program from the standard one that will be described later in this manual, is absolutely necessary until the athlete achieves the required flexibility in order to proceed with the exercise(s) that has thus far been avoided. Performing flexibility exercises at the end of the workout and, in certain circumstances on non-training days, is essential for new lifters with flexibility problems, so that they can begin to learn the needed exercises as soon as possible.
V. Flexibility Training

Flexibility training is one of the key elements of the training programs of most beginners in weightlifting. It is the rare beginner who has sufficient flexibility in every area of his body needed to execute all of the competitive events of Weightlifting and related exercises. Those who logged a perfect score in the flexibility assessments presented in the prior chapter won’t really need to do the exercises presented in this section of the manual. But for those who need at least some improvement in flexibility in one or more areas of their bodies (the majority of beginners), the information in this section will be critical for their lifting success.

Common Fallacies Regarding Strength Training and Flexibility

There are a number of common myths relating to strength training and flexibility. Although it has been proved that weightlifters are among the most flexible athletes in the world, many still believe that weightlifters are inflexible and that their training makes them so.

There is no evidence that strength training reduces flexibility, particularly when full range of motion exercises, such as full squats, are done. In fact, there is substantial evidence that full range of motion strength training improves flexibility.

There is also no evidence that flexibility training has any negative effect on strength, unless such training is conducted immediately before maximal weights are lifted. In this latter case, there is evidence that static stretching can reduce the strength and power of muscular contraction for at least several minutes following such exercise. That is why stretching immediately prior to heavy lifting is not advised and flexibility training aimed at increasing one’s range of motion is always placed at the end of the workout (the exercises that athletes perform to reach their current level of mobility prior to their weight workout are well behind the lifter once the heavier lifts of their workouts begin).

Finally, there is no evidence that increases in muscular size will decrease flexibility and cause the athlete to be “muscle-bound.”

Some Basic Facts About Flexibility and Training for It Through Stretching

When one does strength training, increases in strength occur because of the body’s adaptation, over time, to the training stimulus. Similarly, flexibility training, if conducted by consistently working to gradually increase one’s range of motion, will result in increases in flexibility.

The structure of one’s bones and joints places inherent limits on flexibility, as does a limited ability to alter the flexibility of tendon and ligaments. This is good because it is the work of these elements of the human body in concert that gives us an ability to control movement, stabilize the body, and prevent injury. For instance, an athlete becomes capable of assuming a correct low squat position by learning to maintain the appropriate tension in the torso to remain erect with the lower back arched, while at the same time being able to relax the muscles of the legs and hips, so that a full squat position can be attained.

In contrast, muscles can be trained to increase their range of motion quite significantly. This occurs both as a result of changes in the muscles themselves and changes in the coordinative patterns of muscle tension both within particular muscles and among groups of muscles, and the degree of muscle specific relaxation that an athlete is able to generate.

For instance, an athlete becomes capable of assuming a correct low squat position by learning to maintain the appropriate tension in the torso to remain erect and in the universal weightlifting position, by keeping the lower back arched while at the same time being able to relax the muscles of the legs and hips, so that a full squat position can be attained.

When training for increased flexibility, it is strongly advised that:

1) only muscles that have been warmed up through a general or specific warm-up be stretched;
2) gradual increases on the range of motion are achieved during stretching and no sudden moves into the full range of motion are attempted;
3) only the current range of motion is sought during warming up and no effort is made to improve the current range of motion;
4) flexibility exercises cease as the specific warm-up progresses, and they are not resumed until skill building, and power and strength training during a given training session have been completed;
5) flexibility training to increase an athlete’s range of motion is performed immediately after strength training has been completed, while the muscles are still warm.
Remember that the goal of training for an increased range of motion is to enable the athlete to comfortably and rapidly assume the correct starting and receiving positions during the competition lifts and related exercises. Progress toward this goal is tested by repeating the assessments described in the prior section of this manual. Only when an athlete has achieved the desired positions in all four assessments can unrestricted training on all lifts be commenced.

**Maintenance of Flexibility**

Those athletes who have had significant difficulty with one or more of the assessments, so have had to train for the flexibility needed to reach the desired position, will need continued practice of the flexibility exercises that were used to attain the desired level of flexibility. That typically only requires performing those exercises three times per week, at the end of the workout. But the lifter should be aware that a failure to perform this maintenance work altogether will often result in the athlete’s regressing in terms of flexibility. The good news is that typically only one to two sets of the stretching exercises performed two to three times per week will be required to maintain one’s level of flexibility.

**Methods of Stretching**

As will be explained later in this manual in the chapter on “Designing Training Programs,” there are two fundamental purposes for stretching. One is to help an athlete achieve his/her current range of motion while the other is to increase that range of motion. Exercises for the former objective are performed during the warm-up. Exercises for the latter purpose are performed after all resistance training exercises have been completed.

There are many recognized forms of stretching, but they can be broken down into several main categories.

**Static**

Static stretching is an effective and popular technique for improving one's ultimate range of motion at slow speeds, or when one is static. It involves slowly moving into a position nearing one’s maximum range of motion and holding that position, typically between ten and thirty seconds, during which period the athlete will try to extend his maximum range of motion. This stretch may be repeated after a brief period of rest. Static stretching is most useful for increasing one’s ability to achieve improved range of motion through a slow movement or to achieve a static position (such as the start position in the snatch), but the carry over to the dynamic movements of most sports, including Weightlifting, is somewhat limited.

**Ballistic/Dynamic**

Ballistic stretching involves moving a limb or body part such as the torso through a range of motion that is assisted by momentum which is achieved by bouncing or swinging. Progressively higher leg swings would be an example. Such exercises prepare those who practice them for rapid movements to a full range of motion.

However, there are concerns that this form of stretching can result in injury, either through micro trauma over a period of time, or through one catastrophic event, although evidence of this is limited in athletes who have warmed up thoroughly before stretching to extreme ranges of motion. And achieving a full range of motion only for an instant is likely not optimal in terms of training to achieve one’s mobility potential. It has also been argued that rapid stretching activates a “stretch reflex,” a neuromuscular response to a rapid stretch that causes an increase in muscle tension which actually limits one’s range of motion. Ballistic stretching is not widely practiced by weightlifters.

**Passive vs. Active Stretching**

In passive stretching, the athlete’s body is moved through a range of motion by a live, mechanical, or robotic stretching partner. Greater ranges of motion can generally be achieved passively than by a person stretching unassisted. Having a partner may also help to assure that flexibility training will actually occur. But such stretching presents the risk of over stretching by the partner, and there may be limited carryover from the ranges of motion that can be achieved using this method, relative to what can be achieved unassisted.

In active stretching the athlete completes the entire stretch with no assistance. Active stretching can be either static or ballistic, but the term generally refers to a stretch where the fullest possible range of motion is achieved by smoothly moving the body part being stretched into its maximum range of motion without swinging or bouncing. Then that position is held briefly before returning to the start position and repeating the stretch. This method is considered safe and effective for achieving one’s current available range of motion and can be used in certain circumstances for improving one’s range of motion.

In passive-active stretching, a partner assists the athlete in achieving a given range of motion and then the athlete attempts to hold the position reached for several seconds. A greater range of motion can be achieved through this method than when the athlete acts alone, but the carry-over to active athletic situations may be limited.
In active-passive stretching, the athlete actively stretches the muscle to its limit. The partner then helps the athlete achieve a greater range of motion. The advantages and concerns here are similar to those of passive and passive active stretching.

**Active Isolated Stretching (AIS)**

This form of stretching, advocated by Mattas, and adopted by many others, argues that if a strenuous stretch is held for more than a couple of seconds, a stretch reflex actually begins to resist the stretch that activated it. Therefore, the recommendation is that once a fully stretched and increased range of motion position is achieved, it is held for only two seconds, followed by a return to the pre-stretched position. After one second, the stretched position is assumed again. So instead of achieving a stretched position and holding it for an extended period, as would be done in a traditional static stretch, increased range of motion is sought during a set of perhaps 10 repetitions, with each rep consisting of moving into the fully stretched position from an non-stretched starting position, holding it for two seconds, and then returning to the start position. AIS stretching, is often performed with assistance from a partner or other device that the athlete uses to achieve a greater range of motion than would be possible by a pure active stretch.

Many athletes have found the AIS approach to stretching to be more comfortable and effective than static stretching, and it is the one recommended for performing the squat and snatch stretches described later in this manual.

**Proprioceptive Neuromuscular Facilitation (PNF)**

This method of stretching involves movement into one’s maximal range of motion, or as close to that as possible, by contraction of the muscles being stretched to oppose stretching motion. These muscles are contracted for several seconds, to fatigue them, and then they are again relaxed. During the relaxation, an effort is made to achieve a greater range of motion usually with the help of a partner. This process continues several times per set, until the athlete has achieved what feels like a maximal range of motion for that set. Regardless of the mechanisms that may be at work in such a stretch, it is possible for most athletes to attain a greater range of motion during a set of PNF exercises than most other ways. This approach has been advocated by many, but Kurtz and Moon are among the most popular advocates of this method. This is the method recommended in this manual for performing the elbow stretch.

**Strength/Resistance Stretching**

There are several methods of stretching which involve combining contraction and relaxation, and some of these methods have become very popular with athletes who are seeking to increase their range of motion. An example is resistance or strength stretching. With this method, the athlete moves to the current maximum range of motion and contracts the muscles being stretched forcibly while at the same time working to further extend the range of motion. The premise is that, contrary to what is generally believed, the simultaneous effort contracting and stretching can enable the athlete to achieve greater ranges of motions more safely. Cooley is probably the most popular advocate of this kind of flexibility training.

**Summing Up The Flexibility Training Process**

Stretching practiced to increase ones range of motion will produce results over time. Such stretches, regardless of the method, should be practiced only at the end of the workout while the athlete is still warm. Such training can be very strenuous and many athletes will find that they are most effectively employed several times a week, rather than daily. This is in contrast to stretching to maintain one’s range of motion and can be performed daily following the appropriate warm-up. We have presented many approaches to stretching and different athletes will respond in different ways to these approaches. In the end, the method that helps the athlete to progress, without causing discomfort that continues after the stretch, is what is being sought.

**Weightlifters Need Sport Specific Flexibility Training**

Weightlifters need flexibility in specific areas of their bodies in order to perform the competitive lifts correctly. It is not unusual to see beginning lifters, who demonstrate an advanced ability in classic flexibility tests and exercises like the full split, who are completely unable to assume the positions required of the accomplished lifter. Therefore, those who do not already possess the requisite flexibility to perform the snatch and clean and jerk must practice stretching exercises that are specifically designed to help athletes meet the specific flexibility requirements of Olympic-style lifting.

The following exercises have been found to assist the lifter in achieving the type of sport specific flexibility that is required for successful Olympic style Weightlifting performances. There are many other useful flexibility exercises and those other exercises may well be required for those who attempt to master styles other than the squat clean, squat snatch, and split jerk, but such exercises are beyond the scope of this manual.
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Using an old fashioned power rack with 1” hole drilled from side to side, place the bar through the appropriate hole. If you are using a cage style rack, you can place the 1” pin that is usually used to catch the barbell at the appropriate height and you face the cage sideways, so that you are between the front and back uprights on one side of the rack. If your rack is not a cage and has no side to side holes, you can place a bar loaded approximately to your bodyweight at the appropriate height. Then face away from the rack (so that the uprights supporting the bar and you are behind the bar) and perform the exercise as described below.

Grasp the bar with a shoulders width (clean width) grip. Position the middle of your feet directly under the bar. Descend into the full squat position while holding onto the bar. Set your torso in an upright position so that your hips are directly under the bar, being sure to maintain the arch in the lower back. Now relax and allow your shins to tilt forward so that your knees travel forward, directly forward of and in line with the toes.

1) Squat Stretch In Rack

The lifter uses a standard “power rack” or “power cage” to set a bar in an immovable position just high enough for the lifter to assume a full front squat position under it. The bar is loaded approximately to the lifter’s bodyweight and is placed against the rear upright of the rack at the appropriate height. The lifter faces the front of the rack (so that the uprights supporting the bar and the lifter are behind the bar). The lifter grasps the bar with a shoulders width (clean width) grip. The feet are positioned as they would be for a front squat but with the middle (instep) of the feet is positioned directly under the bar. The lifter descends into the full squat position while holding onto the bar. The torso is set in an upright position, so the hips are directly under the bar, being sure to maintain the arch in the lower back. Now the legs are relaxed and the shins tilt forward so that the knees travel directly forward of, and in line with (side to side), the toes.

At this point the lifter uses the arms to push up against the bar, driving the hips down into a full front squat position while maintaining the back arch. It of ten helps if the lifter imagines that he has a partner, rather than his arms, pushing him into the deep squat position. The lifter must not push up with the legs, but rather push himself down, using the bar to assist her, by pushing up against it with her arms.

What the lifter is doing with this exercise is learning to relax the legs while keeping the back arched, the torso rigid and upright. In the beginning, the lifter may have trouble keeping the torso upright and the back arched, but with practice he will be able to do this successfully. The lifter may need a ½” to 2” board under his heels to assume a correct position, at least initially (this board is discussed more fully in the next section of this manual).

The lifter holds the low position for two to three seconds; then, leaving the feet in place and the hands on the bar, stands up behind the bar and relaxes for a second. Again he descends back under the bar to repeat the stretch. This can be repeated for 8 to 10 repetitions. On each succeeding repetition, the lifter tries to push himself down a little lower into the squat position; however, he must never push herself so low that he loses the arch in his lower back.

A squat snatch position variation of this exercise can be done with the bar set at a height just below the lockout position of the low squat position of the snatch. In this stretch the lifter pushes up on the bar to lock the arms and simultaneously drives the body down into a lower squat position.

Finally, if you do not have access to the kind of rack described above, an alternative is to use a rope or similar device that is approximately 1” in diameter and 8 to 10 feet in length. With this approach, the lifter stands on the middle of the rope and grasps either end of the rope in his hands. The point at which the lifter grasps the rope is slightly above waist height (for the clean version of the stretch). The lifter squats down until the hands are above the shoulders, and then pushes up against the rope as if it were a bar. The lifter can perform the snatch version of the stretch by grasping the rope at around shoulder height. Using a rope takes more balance and coordination than using a rack, but it can be just as effective as a rack and has the advantages of teaching balance in addition to stretching the athlete out, and being more portable, storable, and affordable.
The “Board” – A Temporary Solution for Lifters Who Lack Leg/Hip Flexibility

If an athlete has insufficient flexibility in the legs, ankles, and hips to perform a correct back squat, overhead squat, or front squat, this problem can often be remedied on a temporary basis by placing a board under the heels of the athlete. This is particularly helpful for athletes who do not have weightlifting shoes at the outset of training. Weightlifting shoes typically have a significant heel built into them, whereas many other kinds of athletic shoes do not. The board described below can make up for this initially, while the lifter is learning to squat correctly, but it should never be used for performing any form of snatch, clean, or jerk, as there is foot movement during such lifts and a lifter could trip on a block.

For some lifters this block may need to be as much as an inch and a half high which is the height of the standard 2x4 placed flat. For others, a strip of ¾” plywood laid flat will suffice. The majority of athletes will be able to assume a reasonably correct squat position with a raised heel of this type. The raised heel will enable the athlete to do some squats (front, overhead, and back) while working to improve squatting flexibility, so that eventually only the standard height heel in a weightlifting shoe (typically about one inch) will be necessary.

One word of caution is appropriate here. If a new lifter has been performing squats with a lower or no heel (e.g., powerlifting squats with the bar low on the back), such a lifter should get used to squatting in a more upright position with an empty bar for a while by using the block, even if a much heavier weight is possible. This is because the knees need time to get accustomed to squatting with a higher heel and with the torso in a more upright position. In the meantime, the lifter can maintain leg strength squatting in his customary style and substitute the new style as he becomes comfortable with squatting with heavier weights in the new style and with an elevated heel (this while the lifter is working to improve flexibility, so that a heel of approximately an inch is all that is needed to assume a correct position).

Eventually, as the lifter practices the squat and does the squat stretching exercise described in the flexibility exercise section of this manual, a lower and lower board will be needed until eventually no board, but only a lifting shoe with an elevated heel, will be required in order to maintain a good position. In rare cases, a lifter will not be able to develop the requisite flexibility to squat properly. In such a case, the lifter may wish to have an additional heel added to the lifting shoe. Initially, heels of varying height can be placed on the inside of the shoe to determine the correct height, before the athlete adds a permanent heel on the outside of the shoe. In rare cases, the “split” style, which is beyond the scope of this manual, may need to be used instead of the squat style.
2) Elbow Stretch

For this exercise, the lifter uses essentially the same equipment as was used for the squat stretch. However, for this exercise a partner is required. The lifter begins the exercise by assuming a low front squat position with the bar resting on the shoulders, or as close as possible, and the full hand around the bar (i.e., not with the bar resting on the finger tips). The partner grasps the elbows of the lifter and pulls them gradually upward until they will go no further. The athlete being stretched will generally feel some mild to moderate discomfort at this point, generally in the wrists, but sometimes in the elbows and shoulders. The lifter being stretched may also feel as though he/she is choking slightly. If so, the lifter should endeavor to set the bar a little further forward on the shoulders, so that it is not pressing against the neck so much.

Now the lifter pulls the elbows down against the hands of the partner while the partner resists, so the lifter as isometrically pulling the elbows downward against an unmoving resistance from the partner. After about 5 to 6 seconds of such a pulldown effort, the lifter completely relaxes the rear deltoids (shoulders), the upper back muscles, the arms and wrists, and any other muscles that have been pulling the elbow and arm downward.

He/she will find that these muscles have now further relaxed because they have been fatigued, and this will permit the elbows to be lifted higher by the partner than before. Again, the partner gently pulls the elbows up to the point where mild discomfort is felt. This position is held for about 5 seconds. Then the lifter repeats the downward pull against the partner's unmoving hands with the elbows at this new and higher position. This process can be repeated several times, each time with the elbows ending up in a significantly higher position than could be achieved on prior repetitions.

We have literally seen very stiff, 350 pound lifters with huge arms use this exercise to enable them to rack the barbell comfortably on their shoulders with the elbows well up (which is a pre-requisite for safe squat cleaning) and with the fingers wrapping fully but loosely around the bar.

This is perhaps the most unpleasant stretch the athlete will ever do, but it is also one of the most effective. It is a must for lifters who are not able to rack the bar on the shoulders correctly when they begin to learn the lifts. A lifter should not even attempt a power clean or front squat, let alone a squat clean, before you can rack the bar comfortably.
3) Dislocates

For lifters who are having trouble holding a bar or stick overhead in the overhead squat bottom position, one of the most effective remedies is an exercise referred to as the “dislocate”. The athlete is definitely not actually dislocating the shoulders during this exercise, but rather is rotating them within their sockets in a normal range of motion.

The exercise is best performed by grasping a broomstick with both hands and a wide grip, perhaps, even wider than the grip that was used in testing overhead squats. The stick should then be placed overhead with the arms fully locked at the elbows. Now the lifter rotates the stick to the position shown in the last of the four photos, or at least with the hands below the shoulders. Throughout this stretch the arms are fully extended with the elbows locked. The motion is then reversed to return the stick to the start position. This entire movement is then repeated 8–12 times. Most lifters will find that as they do this, their shoulders rotate such that the crook of the elbow faces forward. This is perfectly normal and desirable.

Progression in this exercise starts with a grip the lifter can comfortably use to achieve a full rotation from in front of the head to behind and back to the front with the elbows held strictly locked. Lifters will find that the wider the grip, the easier it will be to perform this motion.

The grip is gradually narrowed on each rep, until a grip width is reached where the lifter finds it challenging, but possible, to keep the elbows locked throughout the rotation. A record is made of that grip width and the lifter strives, over time, to narrow the grip that can be used while still maintaining the elbows locked. A good goal is to be able to do the rotation with the hands held and approximately shoulder’s width, but at least several inches narrower than the one that will be used in the snatch.

Most lifters will find that once such a rotation has been mastered, holding a bar overhead in the squat snatch position will begin to feel comfortable and controlled, especially if the crooks of the elbows are turned forward with the wrists back, which is the alternative arm position discussed earlier in this manual.
4) Clean or Snatch Deadlift Stretch

When a lifter has difficulty assuming the correct position at the start of the clean or snatch from the floor, this stretch will be indispensable. Ideally, the lifter performs the exercise with full diameter (45 cm.) plates (even if a lighter than competition bar and plates must be used). The correct weight is one that pulls the lifter gently downward, assisting with the stretch yet is light enough so the lifter does not become tired after doing a few reps.

The lifter begins by holding a barbell in the completed deadlift position. If the lifter passed the clean deadlift flexibility test described earlier, the exercise is done with the snatch grip, but if even the clean deadlift position could not be achieved initially, the clean grip is used. The lifter then lowers the barbell as low as possible while maintaining the arch in the lower back and a flat upper back (i.e., not hunched or rounded). If the lifter is unable to go all of the way to the floor while maintaining the correct posture, the goal is to lower the barbell progressively closer to the platform, while maintaining the correct posture. The lifter will find it easier to do this if the leg muscles, particularly the adductors on the insides of the thighs, are relatively relaxed. Eventually, the lifter should be able to stand on a low (e.g., 1") mat or large plate and reach the floor with an arched back using a snatch grip. However, a clean grip is first employed if that has been a problem from the outset.

While performing this exercise, it is very important for the lifter to have feedback from the coach or other onlooker who knows what to look for (to determine whether or not the correct posture is being maintained). It is common for new lifters to think they are maintaining the correct torso position when they are not.

To provide direct and real time feedback regarding the back arch, you can use two mirrors. One is positioned in front of the lifter and the other at an angle to the side. Correct mirror positioning will enable the lifter to look forward into the mirror in front and see whether his/her posture is being maintained. This is important because you do not want the lifter to be looking into a single mirror positioned at the side to see whether he/she is in a correct position; the very act of turning the head to the side can cause a poor position or even result in an injury to the back or neck as the spine twists.

A more technologically advanced approach is to place a video camera on the side of the lifter and a monitor in front of the lifter, so that he/she can see the position of the spine in real time.

This exercise can be done using the AIS stretching technique previously discussed by lowering the bar to the lowest position possible while maintaining a correct posture, then returning to the standing position and repeating for 5-10 repetitions.
5) Jerk Stretch

Lifters who have difficulty with positioning the bar correctly over the shoulders in the military press assessment will benefit from a special jerk or shoulder stretching exercise. The object is to make the lifter feel comfortable with the bar overhead in the correct position and with the elbows fully locked.

The stretch is typically done using a power rack or cage. The bar is positioned at a height where the lifter is in a partial squat or split jerk position, or slightly lower, with the arms locked. The lifter raises the bar just enough to clear the pins (use the spotter pins in a cage rack). While holding the bar overhead, the lifter tries to ease the bar back to a correct position while keeping the elbows fully locked. This is generally best accomplished by endeavoring to turn the crooks or inside of the elbows toward the front while relaxing the shoulders and pulling inward on the shoulder blades.

Over time, the lifter should be able to hold a barbell loaded with a lightweight overhead with the elbows fully straight and the bar slightly behind the middle of the shoulder joint without feeling undue pulling on the shoulders. Such a lifter is then ready to begin learning the power and full split jerk.
The Bar on the Knees Stretch

Many lifters find that this exercise helps them to stretch their ankles, so that a correct squat position can be assumed. The lifter assumes the position shown and pushes forward and downward on the bar, to push the knees forward and downward. This can be done several times.

Many lifters also find some more generic stretching exercises than the weightlifting oriented ones already shown. Some perform these after a light warmup at the outset of the workout if they particular area that they feel needs to be stretched, but more often they are done at the close of the workout as part of their “cooldown.” Some examples of such exercises are shown in the illustrations below.
Why Teaching Good Technique from Day One Is Absolutely Critical

In this section of the manual we will discuss sound methods for teaching and learning the basic exercises used in weightlifting training. An outstanding coach of beginning and intermediate lifters is perhaps first and foremost a teacher of correct technique. Good technical habits learned by athletes early on will tend to carryover throughout their careers. Unfortunately, poor technical habits learned early are very difficult to correct later.

It is absolutely essential that the coach focus beginners on learning sound technique from their first moment in the gym. Of all lessons a coach can provide to their beginning athletes, an understanding of good technique and how to develop it is perhaps the most important. Top athletes develop their technique through relentless efforts over a period of many years (improved technique in athletes five years after they debut at a world championships is a common occurrence). But in order for this to happen, a devotion to perfecting technique must be developed early on in an athlete’s career.

Good Technique is Much Safer

While Weightlifting is a safe sport relative to other strenuous sports such as soccer, gymnastics, football, and basketball, it is much safer still if good technique is learned and practiced throughout a lifter’s career. Good technique is biomechanically sound, so it minimizes the stresses on a lifter’s body that heavy weights can deliver. We, in USA Weightlifting, are interested in safety first and foremost, so to us learning good technique is not only effective; it is the right thing to do.

Good Technique Is The Primary Foundations of a Successful Career

What a lifter learns in his or her early days of training will impact the rest of that athlete’s career. A sound building cannot be built on a weak foundation. Sound basic technique is perhaps the most important foundation for a Weightlifting career that will require continual technical development throughout that career. Moreover, if that sound foundation is not laid at the outset, it will be very difficult to correct it later on. One of the truisms of coaching is that it is much easier to teach someone to lift correctly with no background in weightlifting than it is to correct the mistakes someone has been making for some time.

Good Technique is Efficient

Good weightlifting technique is by definition efficient. It enables a lifter to maximize the amount of weight a lifter can lift overhead with a given level of strength and power. Therefore, if a lifter wants to maximize his or her potential and be as competitive as he or she can be, good technique is essential. The good news is that perfecting technique in no way impairs the development of strength and power. Quite the contrary, it maximizes a lifter’s ability to develop and express those qualities.

Good Technique Minimizes Frustration and Maximizes the Joy of Lifting

Perfecting weightlifting technique can be one of the most enjoyable aspects of an athlete’s career. Just as athletes in sports ranging from bowling to baseball, from diving and golfing, learn the joy of hitting that “sweet spot” or “groove”, weightlifters experience great joy when they master the art of lifting a weight with sound technique. Elite lifters have all experienced moments when they have lifted a maximum weight with seemingly minimal effort, a lift in which the weight almost seems to pull them up rather than push down against them. This sublime experience only comes to those who learn to time their lifts perfectly through many thousands of hours of technical practice.

On the other side of the coin, those who do not perfect and stabilize their technique will find it much harder to lift their maximum weights. Moreover, they will miss much more. As a result, their competitive performances will be inconsistent and they will often miss lifts when they matter most. When a lifter knows he/she is strong enough to master a weight, but fails for lack of good or consistent technique, the frustration can be terrible. All of this can be avoided by learning correct technique at the outset and then working to stabilize and perfect it further throughout one’s career.

Good Technique Eliminates Fear of Heavy Weights

There is nothing rational to fear when a lifter attempts maximal weights. If one is healthy, one’s technique is consistent, and the weight is within the bounds of the amount that can be lifted; given the athlete’s current level of strength and power, a successful lift is likely and a missed lift will fall safely back to the platform. Therefore, the skilled athlete will almost invariably be courageous, as such an athlete knows there is no serious downside to an all out assault on a heavy weight.

VI. Basic Exercises Used in Weightlifting Training
But when one knows that one’s technique is faulty or inconsistent, fear creeps into the mind of the athlete, no matter how tough he/she may be. Even if an athlete is determined to succeed on a conscious level, the all-knowing subconscious will often step in to stop the athlete in mid-lift. The subconscious will in effect be saying, “You do not know how to lift this weight,” or “You can not jump into a position under a heavy weight when you do not really know how to do it.” Such subconscious thoughts can lead to aborted lifts. This is another good reason to learn good technique from the outset.

The Bottom Line on Technique

For all of the previously mentioned reasons, and many others, cultivating sound technique from the outset, and then improving it on an ongoing basis is one of the most important keys to a successful Weightlifting career. Do not let the athletes you train sell themselves short by failing to master proper technique. Follow the steps outlined in this course, and in later ones, to help your athletes safely achieve their ultimate potential and the ultimate joy they can achieve in the wonderful sport of Weightlifting.

Learning the Basic Weightlifting Exercises

The squat snatch, squat clean, and split jerk are somewhat complex movements. Consequently, most athletes find it easier to learn them when the learning process is broken down into a series of steps. In this section of the manual, we introduce what we consider to be the most essential exercises that are useful when one learns how to lift. Not every athlete will need to practice each and every one of these exercises extensively, although many will.

We break these basic exercises into two categories. The first category is referred to as “Progressions”, exercises that most athletes will need to learn and practice, in a specific sequence, in order to learn how to perform the competition and related lifts. The second category is “Supplementary” exercises. These are exercises that some athletes will truly need, while others will not. Most athletes will benefit by practicing at least some of them from time to time.

The table below summarizes the exercises and presents them in a sample sequence that would be appropriate if the lifter has no flexibility limitations that preclude the practice of a given exercise (if the athlete did not have the requisite range of motion to practice that step or stage in the progression effectively its practice would be delayed until sufficient flexibility was achieved):

<table>
<thead>
<tr>
<th>LIFT BEING LEARNED</th>
<th>First Stage</th>
<th>Second Stage</th>
<th>Third Stage</th>
<th>Final Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snatch</td>
<td>Power Snatch from power position</td>
<td>Power Snatch from mid-knee</td>
<td>Power Snatch from floor</td>
<td>Transition to full squat snatch from floor</td>
</tr>
<tr>
<td>Overhead squat</td>
<td>Overhead squat</td>
<td>Overhead squat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean</td>
<td>Power Clean from power position</td>
<td>Power Clean from mid-knee</td>
<td>Power Clean from floor</td>
<td>Transition to full squat clean from floor</td>
</tr>
<tr>
<td>Front squat</td>
<td>Front squat</td>
<td>Front squat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jerk</td>
<td>Footwork with dip</td>
<td>Footwork without dip</td>
<td>Footwork with stick overhead but without dip</td>
<td>Transition to full split jerk</td>
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<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power Jerk</td>
<td>Power Jerk</td>
<td></td>
</tr>
</tbody>
</table>
We will explain these exercises in the text that follows, but before we present the basic exercises, we want to introduce three concepts that apply universally to all exercises — proper breathing, the weightlifter’s posture, and gripping the bar effectively.

**Proper Breathing**

While weightlifting is an anaerobic activity (can be done without oxygen) weightlifters do pay some attention to proper breathing during their lifting. The basic reasons that proper breathing is needed to supply the oxygen that helps replenish the energy the body uses when it performs an anaerobic activity, and proper breathing can help the lifter attain and maintain the correct lifting posture when the lungs have been inflated. Therefore, before the lifters begin virtually any lift, he/she inflates the lungs by breathing in and then assumes the correct posture, while holding the air in the lungs. This does not require an artificially large breath, some lifters think of taking in a half breath, but simply that the lifter inhale normally and then hold the breath in as the lift commences.

**The Universal Posture of Weightlifting**

You will notice throughout the video footage the sequence photos of the snatch, the clean, the jerk, and virtually all of the other exercises weightlifters perform, lifters maintain a posture with these important characteristics:

1) the chest is inflated and “up” and shoulders are back as if the athlete is standing at attention; thus minimizing the natural curvature of the upper back (the upper back is never rounded or hunched);

2) the lower back is arched in the same way as it is when a person is standing at attention so that the natural curvature in the lower back is always maintained (never exaggerated nor diminished);

3) the head is vertical or looking slightly up, and the eyes are looking straight ahead or slightly upward.

This is the universal posture of weightlifting whether you are taking the bar from the floor, performing a squat, or holding a weight overhead. Maintaining this posture at all times helps to protect the back from overstress and helps to assure that the tremendous force delivered by the legs and hips during the lifting process is transmitted directly to the barbell during all of the lifts, rather than having the force generated by the legs and hips dissipated through a torso that is sagging and absorbing the force of the legs.

While great care must be exercised to assume the correct posture, the good news is that essentially only one posture needs to be learned, and posture is relatively simple and natural. Athletes are often helped in assuming and maintaining the correct posture by thinking of inflating and raising the chest and lifting it up and out, by pushing it forward and minimizing the natural curvature in the upper back, while maintaining the natural arch in the lower back. Many are also helped by thinking of elongating the torso and generating moderate tension in the muscles of the back, particularly the spinal erector muscles that are situated on either side of the spine. Lifting legend, Tommy Kono, recommends having the athlete sit in a chair and raise the chest while lengthening the torso to teach the correct posture.

While most athletes find it relatively easy to attain and sustain the correct posture when they are standing erect, many round their backs when they tilt their torsos forward. Another lifting legend, Zygmunt Smalcerz, likes to have lifters learn to maintain the correct posture when the torso is leaning forward by placing the hand on the knees while inflating the chest and arching the back.

Feedback on the posture via a video or mirror is often helpful as many beginners think they are maintaining a correct posture when they are not.

If the lift commences by lowering the bar (e.g., in the squat) the lifter normally holds that breath until the bar has been lowered to a position from which the lifting of the bar upward commences. Whether the lift begins with lowering the bar or with raising it (e.g., in lifting the bar from the floor), once the upward lifting has commenced (or immediately after it has been completed), the lifter exhales. If a lift is to immediately follow (such as a jerk after a clean or another repetition in the same exercise) the lifter takes a few quick breaths and holds the last one just prior to beginning the subsequent lift. Once the series of lifts has been completed, the barbell is replaced in its starting position and the lifter resumes normal breathing.
Only Two Grips Are Acceptable for New Lifters – Standard and Hook Grips

In the upcoming sections of this manual, we will discuss how to teach the clean and snatch. Before we do that, it is appropriate to discuss the proper means for gripping a barbell. There are only two grips that should be taught to new lifters: the standard or “opposing” grip and the “hook” grip. In the standard grip, the palms are pointing back when the bar is gripped to lift it from the floor. The thumb wraps around the bar from back to front and the other four fingers are wrapped around the bar from front to back. It is also referred to as the “opposing grip” because the four fingers go around the bar in one direction and the thumb in the other or opposite direction. This grip can be used for all weight lifting exercises that involve gripping the bar, particularly all forms of pressing, jerking, and squatting.

However, the strongest possible grip for lifting a barbell from the floor is known as the “hook” grip. No one quite knows when this grip was invented, but it is an incredibly powerful ally for all weightlifters who wish to lift maximum weights in the snatch and clean. The hook grip not only increases the amount a lifter can lift, but it helps to assure good technique, because a lifter who is struggling to hold onto the bar will tend to bend the arms during the pull, which is a clear and serious technical mistake and one that is very hard to correct once it becomes a habit. So important is the hook grip that no top lifter in the world uses any other grip when he/she attempts a maximum snatch or clean. It is simply a must.

The hook grip is secured by hooking the thumb around the bar, then wrapping the index (forefinger) and middle finger, or at least the forefinger, over the thumb, the remaining fingers wrapping around the bar. Virtually all lifters will experience discomfort in the thumb when they begin to use this grip and they must persist through this initial period of adjustment. The discomfort can be mitigated somewhat by wrapping a layer of surgical tape around the thumbs. It can also be mitigated by using the grip for a set or two at the outset of ones training with it, then adding sets using this grip over several workouts. The good news is that over time the discomfort will subside and eventually the lifter will not experience any material discomfort while using this grip.

The grip that should never be used is the “thumbless” grip where the thumb and finger go around the bar in the same direction. This grip is not nearly as strong for lifting the bar from the floor as the hook grip, or even the opposing grip. While some lifters find such a grip more comfortable for the jerk, the likelihood of the bar’s slipping out of the hand during the jerk, or any overhead lift, is much greater than with the opposing grip, although the incidence of the bar so slipping with either grip style is extremely low. The thumbless grip is particularly dangerous in the bench press, where a falling bar can strike the lifter on the face, neck, or chest and trap the athlete against the bench, so this grip should never be used when performing this (or any other) exercise.
A Few Words on the Biomechanics of Proper Technique

A discussion of some basic concepts of biomechanics is provided in the appendix of this manual. However, we want to mention several basic principles of good technique that are derived from biomechanics here, since they apply to every exercise you will learn in the sections of this chapter that follow:

1) Segments of the body that transmit the explosive power generated by the muscles of the legs and hips to the barbell during the explosion phase of the lifts must be rigid (e.g., the torso) or fully lengthened (e.g., the arms). Bent arms or a rounded back during the explosion phase are inefficient and unsafe.

2) The center of the body and bar must be kept within the outer edges of the athlete’s feet if the barbell is to be controlled by the athlete.

3) Every action causes an equal and opposite reaction, so if the lifter throws the head and shoulders back at the top of the pull it will drive another part of the body, such as the hips forward, creating unwanted horizontal motion of the body and/or barbell.

4) The greater the horizontal distance of a barbell from a joint that is supporting it, the more effort the muscles around that joint have to exert to control the barbell (e.g., it is much easier to hold a barbell directly above the shoulder joints than it is to hold the bar when it is forward of or behind the shoulders).

5) Force should be applied to the barbell sequentially, from the center of the body outward (e.g., during the pull, from the legs and hips outward to the trapezius muscles and arms – the latter as the lifter begins to descend under the barbell to catch it).

6) Any time during a lift when the bar is unsupported must be minimized (e.g., time between the explosion in the pull and receiving and exerting upward force on the bar again, whether the bar is caught overhead in the snatch, or on the shoulders in the clean, must be minimized).

The Basic Exercises

The first basic exercise we will introduce is the front squat. This exercise was already presented as an assessment exercise, but now we will focus on how it can be used to teach technique and build strength. But before we discuss that exercise, we want to explain the use of a piece of equipment that is employed for the front squat and a number of other basic exercises.
Using A Standard Squat Rack

In order to perform front squats with any substantial weight above an empty bar, a standard squat rack should be employed. The nature and use of this rack will be described here, but the instructions provided apply to a standard rack, images of which will appear on the photos and video that accompany the explanation of this exercise. Any instructions provided by the manufacturer of the rack should be followed if the racks differ from what is presented here. A squat rack can be used for many other exercises, such as overhead squats and back squats and all forms of pressing and jerking done without a preceding clean.

The first step in using a squat rack is adjusting it to an appropriate height for the athlete. Squat racks are typically comprised of two sets of two vertical metal tubes, each set having one tube that fits inside the other. The inner tube generally has a series of equally spaced vertical holes. The larger, outer tube has one or two sets of holes. In order to lock the fork shaped bar receiving mechanism that sits on top of the inner tube at an appropriate height, a pin is inserted through the set of holes in the outer tube and the inner tube when the holes in these tubes are aligned. This is done on each side of the rack before the bar is placed on the rack (never try to adjust the height of a rack when it is supporting a loaded barbell).

Once the height of the forks is set, a bar is placed on the forks; the front part of the fork is very short, perhaps an inch in height or less, while the back part of the fork is several inches high. The correct height for the bottom of the fork, which supports the bar, is one that requires the athlete to bend the legs only a few inches in order to get under the bar, but it also enables the bar to clear the front fork by an inch or two when the athlete stands up with the legs straight. The lifter faces the rack to remove the bar and, after placing the shoulders under and in contact with the bar with the torso in a vertical position and the feet under the hips and shoulders, the lifter extends his/her legs. The athlete then backs out of the rack by stepping back one or two steps, until the feet are in line, and is ready to begin the front squat as described in the section below.

At the conclusion of the squat, the lifter walks forward into the rack with the torso held upright. The lifter should never lean forward to replace the bar in the rack. Rather she should step slowly toward the rack with the torso held vertical, until the bar gently touches the rear fork of the rack on each side. Then the lifter bends the legs until the bar contacts the bottom of the fork solidly. The lifter then moves out from under the bar. It is not necessary, or even desirable, to look at the forks when one is replacing the bar in the rack as this generally results in the lifter’s turning the head and even twisting the body to contact the fork on the side being focused on. Then, when the lifter looks at the fork on the other side, the bar may move away from the rack on the opposite side. Looking straight ahead and being guided to the rack by peripheral vision and gentle contact with the rear forks is a much safer and more effective strategy (the lifter should be careful not to push on the rear of the forks forcibly as this could tip the rack backward).
**Front Squat**

The front squat is the most specific exercise for strengthening the legs so that the lifter can stand up from the low squat position in the clean. Therefore, most weightlifters perform it very regularly, and beginners use it to learn the low receiving position in the clean, as well as to strengthen their legs.

To begin the front squat, the lifter approaches a bar appropriately positioned on a squat rack, places the feet and shoulders directly under the bar, with torso strictly vertical, grasping the bar with the hands just outside shoulders. The bar is supported by the shoulders, which are slightly raised, and may gently touch the clavicles, the collar bones. The palms of the hands are also in contact with the bar with the fingers encircling the bar from rear to front and the thumb from front to rear. The elbows are at the same level as the shoulders, or slightly lower and are positioned so that they will be well inside the knees when the full squat position is reached.

The lifter extends the legs until they are straight and takes one or two steps back from the rack with the torso and arms maintained in the positions they assumed at the rack. The feet are placed so that they are in line from side to side and, at hip width or slightly wider, with the toes turned out somewhat. The feet are flat on the floor and remain so throughout the lift.

Just before the squat begins, the lifter inhales at least partially and makes an effort to raise the chest and stiffen the torso somewhat to achieve the starting universal posture. The eyes should be focused straight ahead, on a spot on the wall or other stationery object, and remain so throughout the lift. As a result, the lifter will be looking slightly upward when the lifter reaches the low position in the squat.

Keeping the torso vertical and held in the universal weightlifting posture, the lifter bends the legs at the knees so that the knees travel forward, but in line with the toes, as the legs bend into a full squat position, the knees ending up in front of the toes. The balance is toward the middle of the foot or slightly behind it at the outset, then shifts slightly toward the front of the foot as the lifter descends into the full squat position. The lifter squats as low as possible, preferably until the bottoms of the thighs fully contact the calves, while keeping the bar on shoulders, the elbows at the same height as the shoulders or a little below, and the torso upright and in the universal weightlifting posture (e.g., the lower back arched).

If the lifter is having difficulty maintaining the universal posture in the full squat position, the coach can experiment with having the athlete assume a slightly wider stance and/or turn the toes out a little more. These measures help some lifters assume a more correct position. Additional flexibility work will no doubt also be needed. In some cases, the lifter will need a higher than standard heel in his lifting shoes.
From the low position, the lifter straightens the legs and returns to the starting position. It is not unusual for the torso to tilt forward slightly from the upright position about midway through the recovery from the low position in the squat, but this kind of movement should be kept to a minimum and the torso should not lose its universal posture at any time during the lift.

Once the lifter has resumed the starting position or during the recovery from the squat position, he/she exhales, then takes one or more breaths and finishes on a half to full breath to once again assume the start position if further repetitions will follow. Once the set has been completed, the barbell is replaced on the rack as was described above.

It is critical to keep the chest and elbows up while descending into the full front squat. At the low point in the squat, the elbows should be well above the level of the knee, preferably with the upper arm parallel to the ground, or even with the elbow joint slightly above the shoulder. In addition, the elbows should be kept slightly inside, versus directly above the knee joints. This latter point assures that, should the elbows be pushed downward during a front squat, they will pass safely between the thighs rather than being compressed against the knee joint. This latter point is even more important when one is squat cleaning.

The lifter should descend smoothly by neither going artificially slowly, nor dropping in an uncontrolled manner to a full position as low as possible while maintaining a correct torso position. Upon reaching that position, the lifter should immediately recover from the squat, keeping the torso upright and arched; many lifters find that looking up somewhat aids in this process. This does not mean rebounding, but rather reversing direction and moving upward as quickly as possible once the direction is reversed in an explosive effort. The more upright the lifter’s torso at the bottom of the squat the better.

The full position in the squat is recommended on very practical grounds. The competitive weightlifter will be catching cleans and snatches in the lowest possible squat position in the name of efficiency as the lower the lifter is able to catch the bar, the less high the bar will need to be lifted in the first place, thus enabling the lifter to lift more. However, it should be pointed out that the warnings one hears against doing full squats, as compared with partial ones, are, in the experiences of long term weightlifting coaches and lifters, groundless.

It is certainly true that if a lifter goes so low that a correct position is lost, goes heavy before learning to do the squat correctly and obtaining sufficient flexibility to reach a correct position, drops correctly and rapidly into the squat rather than smoothly descends, that lifter can be injured. It is also true that certain people can have genetic dispositions or pre-existing injuries that can preclude squatting to a full position. But, in general, most athletes are not only able to perform full squats safely, but they are safer to perform than partial squats. Athletes who do partial squats are handling more weight than their body can safely control, and should such a lifter mistakenly go deeper than normal, an injury can easily be sustained. Full squats also provide a more complete leg workout than partial squats. But regardless of one’s position on this issue, competitive lifters will hit full squat positions while lifting, so they must train for that by doing full squats.

Lifters should not attempt heavy (for them) front squats until he/she has been taught to miss the front squat correctly with a stick. In this way, the lifter can safely “miss” or drop the bar to the platform without spotters, and should he/she be unable to stand up from the bottom position, spotters may be used for added safety or to help the lifter return the bar to the rack after a failed attempt.
Teaching Athletes How to "Miss" Correctly

Martial artists are always taught how to fall before they are taught throws, strikes, and other offensive/defensive techniques. That is because while the attacks and good defenses are at the core of those arts, the ability to fall safely is a prerequisite to safe practice. The ultimate objective will always be to make others fall, but martial artists must accept the fact that they will fall and they must learn to do so safely. Similarly, weightlifters must strive to eventually never miss a lift. But misses will occur, and often until technique is mastered, so the ability to miss safely must be learned at the outset. Therefore, as we explain how to perform the front squat, the overhead squat, and the jerk footwork, we will explain how one goes about learning to miss safely.

How to Miss a Front Squat or Squat Clean

The lifter should learn how to miss a front squat just in case he/she is not able to recover from the full squat position to the standing position. This method applies to missing a squat clean as well. If the lifter loses his balance, cannot stand up from the low position, or the bar starts to fall off the lifter’s shoulders, the lifter pushes the bar forward with the hands and moves the body, especially the knees, back, so that the bar falls in front of the lifter.

Overhead Squat

The purpose of performing the overhead squat is to teach a new lifter how to control a bar overhead while the lifter is in a squat snatch position. This ability is essential for mastering the receiving position in the squat snatch. Becoming proficient in the overhead squat involves learning how to balance correctly with the bar overhead, how to keep the elbows firmly locked, and the hands and shoulders supporting the bar securely, yet mobile enough to move relative to the body and bar as the athlete moves through the full range of the squatting motion. This exercise generally takes longer to master than the front squat. The overhead squat will also strengthen the shoulders, arms, and wrists so that they can comfortably hold a weight overhead.

It is not unusual for an athlete to feel discomfort in the wrists and sometimes the shoulders when the overhead squat is practiced initially. However, discomfort in the elbows is not common and needs to be addressed immediately. This is most often done by changing the position of the elbows by rotating the arms at the shoulder joints, changing the grip width, and/or practicing exercises that will stabilize the elbow joint, such as various forms of curls and presses. A narrower grip generally places less stress on the shoulders, wrists, and elbows, but this makes it harder to balance the bar overhead.

To prepare for the overhead squat, a lifter generally takes a barbell from a squat rack with the barbell resting behind the neck, and on the up-per back and shoulders. If the rack can be placed wide enough so that the lifter can assume his snatch grip without the hands coming very close to the forks of the rack, the snatch grip is assumed.
For lifters with a very wide or even collar to collar snatch grip, the bar will need to be taken off the rack with a narrower than snatch grip, then the hands can be moved out to a snatch grip once bar has been removed from the rack. This may take some guidance from the coach or another lifter, to assure that the hands are positioned correctly. See the section on “Selecting the Correct Snatch Grip Width” to determine the actual width of the grip. It is critical to bring the hands in until they are only slightly wider than the shoulders before the bar is replaced on the rack after the overhead squat has been completed. This assures that the fingers cannot be caught between the bar and rack forks.

With light weights, the lifter will be able to press the barbell up into a position with the elbows fully locked and the bar over the shoulders. With heavier weights, the lifter will need to use an upward thrust of the legs, similar to what is done in a jerk drive, to get the bar to arm’s length, or the assistance of spotters on each side can be used, with each spotter helping the lifter to get the bar to arm’s length and then releasing both sides of the bar simultaneously once the bar is over the lifter’s shoulders and the elbows are fully locked. It is best for the spotter to support the bar until the lifter then verbally signals his/her readiness (or pre-agreed to count, such as “1, 2, 3”).

The starting foot position is similar to that of the front squat as the feet are hip width apart or wider, with the toes turned out somewhat. A somewhat wider stance than is used for the front squat is common in the overhead squat and squat snatch. The grip is snatch width (which is explained later in this manual). The bar is positioned directly above or slightly to the rear of the shoulder joint and the shoulder joint is over the middle of the foot.

It should be noted that if the lifter is able to press the bar up into the start position, he/she should be able to lower the bar slowly and safely onto the rear shoulders after the overhead squat(s) has been completed, being careful not to let the bar come in contact with the vertebrae before contacting the shoulders.

However, once the weight is heavy enough that a leg drive or spotters are needed to get the bar into the start position, it is not safe for the lifter to attempt to lower the bar onto the shoulders after the overhead squat(s) has been completed. In such a case, the lifter should either safely drop the bar in front of the body to the platform, while staying well clear of the rack. In such a case, the bar will need to be replaced on the rack for the next set. Alternatively, the lifter can obtain assistance from two spotters, one on each side of the bar, to lower the bar to the shoulders, after which it can be returned to the rack by the lifter.

Attempting to lower a bar to the rear shoulders without assistance can result in the bar hitting one of the vertebrae before contacting the shoulders and bruising or even fracturing the vertebrae, so this should never be done.

In performing the actual overhead squat, the lifter inhales at least partially, lifts the chest, and assures the torso is rigid, then moves slowly into a full squat position by maintaining balance in the middle of the foot, or slightly toward the rear of the foot. The knees are kept in line with the feet and travel forward of the toes as the lifter descends, until the thighs contact with the backs of the calves, or, if the feet are wide enough, the thighs may travel just inside the calves, but the lifter should never go so low as to nearly contact the floor with the buttocks (a rare but possible situation with very flexible lifters).

The lifter then stands upright into the starting position, exhaling while standing, or after reaching the standing position. The lifter then takes one or more breaths, resumes the start position, and performs any additional reps to complete the set.

The elbows remain firmly locked throughout the lift, but the shoulders may rotate during the lift and the wrists which bend slightly to moderately backward throughout may move somewhat. Beginners should stick to a smooth descent and recovery, at least until they become comfortable and confident with the movement.

The eyes should be focused straight ahead or slightly upward, on a spot on a wall or other stationary object, throughout the lift. This helps the lifter to orient himself and maintain his balance. This notion of focusing on a spot should also be applied in snatches as well as cleans and jerks.

Some lifters will lack the flexibility in the legs and hips to squat down fully with an arched back. Such lifters should place a board under their heels while performing the overhead squat while at the same time performing the snatch version of the squat stretch that was explained earlier.

As was the case for the front squat, the lifter should be taught to miss with a stick before any weight is attempted in the overhead squat. Then, should the lifter lose balance or be otherwise unable to complete the lift, the barbell can be safely “missed” (dropped to the platform).
How to Miss an Overhead Squat or Squat Snatch

Before attempting to learn the overhead squat with an actual bar, one should learn how to miss an overhead squat safely, since that will almost inevitably happen while one is practicing this lift. One of the keys to a safely missing an overhead squat correctly, as well as actual snatch, is to lock the elbows solidly once the bar is overhead and to maintain that lock at all times, even at the outset of a miss. Doing this assures the barbell will be well away from the head and torso of a lifter, even if it cannot be secured overhead. If the bar is being lost toward the front of the lifter, and the lifter maintains the arms in a fully locked position, it is a simple matter to push the bar that is forward even further forward and to pull the knees back and/or to jump back, to get out from under the bar. If the bar is being lost rearward, the lifter pushes back on fully locked arms and jumps forward out of the path of the falling bar.

As long as the elbows are locked, the bar cannot hit the lifter’s head, neck, or shoulders because the locked arms force the bar to move in an arc around the body, reaching a position either 90 degrees forward from a position directly above the shoulders, or 90 degrees backward from such a position. In either extreme of the arc, the bar is away from the head, neck, shoulders, and torso, so the lifter merely needs to complete the miss by moving the legs out of the way and open the hands. It is important that this latter movement be performed immediately after the pushing of the bar forward or back, so that the lower body is out of the way as the bar passes the torso and travels toward the platform.

These movements can and should be practiced with a stick when one is learning the overhead squat by allowing the stick to fall to the platform in front and behind the lifter several times. Using a stick during the learning process prevents any harm from coming to the lifter if he/she should fail to push the bar far enough forward, or back when it is dropped, or fail to jump back if the bar is forward or jump forward if the bar is being lost backward.
It is a generally sound principle of weightlifting technique that the bar and body be moved primarily in a vertical manner throughout the lift and an effort to minimize horizontal motion as much as possible should be undertaken.

Weightlifting is a vertical sport. We lift weights up and we drop the body down. Jumping forward or back, banging the bar forward with the thighs or hips, and splitting forward or back are to be avoided.

In the coming sections of this manual we will be discussing moving into the receiving positions of the jerk, clean, and snatch. One important piece of advice is connecting with the athlete’s movement under the bar is to “drop the hips.” Many lifters, consciously or unconsciously, think of dropping the head or torso when moving under the bar. This is almost always a bad idea. Thinking of dropping the head or torso down often results in the lifter tilting the torso forward and driving the hips back, which are two incorrect movements. Instead, the lifter should be thinking of dropping the hips, essentially the center of the body, straight down as quickly as possible when he is moving under the bar. This will generally result in a correct and efficient descent, whether in the snatch, clean, or jerk.

Jerk Footwork

It is at least as essential to learn the receiving position in the jerk as it is to learn the receiving position in the snatch or clean. Just as we use the front squat to learn the receiving position of the clean, and the overhead squat to learn the receiving position in the snatch, we use the footwork exercise to learn the correct foot positioning and balance for receiving the bar in the split position of the jerk. This is essential, as it is likely that more jerks are missed for a lack of a correct receiving position or poor timing in getting into that position than for any other reason. Yet new lifters tend to practice footwork less than they do overhead squatting and front squatting. This is a major mistake, because learning footwork early on will make learning how to jerk correctly relatively easy.

We use a series of three, progressively more challenging, footwork exercises to teach the correct receiving position in the jerk. In the first footwork exercise in the series, the athlete begins by standing with hands on hips and feet hip width apart. From this position, the lifter bends the legs slightly and then jumps into the split position. Great care must be taken to ensure that foot placement is correct when one is performing this exercise. This means the front foot lands flat and pointing straight ahead, or that the toe is slightly turned in. The back foot lands balanced on the ball of the foot and the toes, and the heel is well off the ground. The outside of the heel should be slightly outside the outside edge of the toe.

Grid to guide foot position

The athlete bends his legs in order to jump into the split position in the first footwork exercise

The outside edge of the heel should be slightly outside the outside edge of the toe

The athlete after jumping into the split position

The athlete holds the stick overhead in preparation for dropping into the split in the third footwork exercise

Front foot straight or toe turned slightly in

The athlete in the split position in the third footwork exercise
In the split position, the front leg is bent considerably, but the shin is completely upright, so the front foot has to move forward enough such that the rear of the foot is directly under the knee. The knee of the back leg should be bent moderately. Both legs should be athletically bent, which is to say they are supportive of the body, eventually bar and body, but flexible enough to bend as necessary for the bar to be locked out overhead without any press out (locking out the arms with the body held in a stationary position). Instead the torso is pushed down crisply by the arms as the elbows are locked.

The height to which a bar is driven in the jerk try will vary, so a lifter must be in position to be low enough to lock the elbows, regardless of the height to which the bar is driven. This requires a flexible receiving position in the legs in the jerk. Too many athletes, in an effort to land quickly with the feet, tighten the leg muscles and refuse to bend them any further once the feet contact the ground, even if that is what is required to lockout the bar crisply overhead. Because the legs are much stronger than the arms, this results in a “press out”, which is both illegal and ineffective. So the lifter must learn the flexible leg concept in order to master the jerk. In short, the elbows always lock during the movement into the split and remain that way thereafter, while the legs only stop bending when the lifter has locked the elbows solidly.

A good way to teach lifters to assume the correct foot spacing when dropping into the split position is to draw on the platform, usually with chalk, a box around lifter’s starting position. The front line of the box signifies the position where the toe of the front foot should land in the split. The back line of the box should be where the front of the toe of the back foot should be placed. Lines on the sides of the box should be at hip width, and the athlete should aim to land on those lines when splitting. Alternatively, a standard size box can also be painted on the platform. The box is 18” wide and 56” long with an additional line dividing the box into front and back halves. Most lifters will be able to use such a box effectively by moving into a correct split position for them and noting the position of their feet relative to the lines of the box. The use of such a box during the footwork drill is extremely helpful, because the athlete can easily look down after each jump into the split position and see how the feet are positioned relative to proper technique. Once the lifter is performing this version of this exercise correctly and is comfortable remaining in the full split position for several seconds, while maintaining his/her balance, the lifter can be given a new challenge. This is to jump into the split position without any preliminary leg bend. In this case, the lifter is dropping immediately into the split, instead of driving hips up slightly with the legs and then dropping. This can take a workout or two to master, but this step is very helpful in preparing for the work to come. In this and the other progressions, the lifter must emphasize dropping the hips straight down into the split (neither moving forward nor backward).

In the final variation of the footwork exercise the lifter holds a stick overhead with a clean (shoulders’ width) grip. The stick should be held directly above the shoulders, or slightly to the rear of them, with the elbows firmly locked. With the stick held in this position, the lifter practices dropping into the split with no preliminary leg drive. The emphasis here must be on dropping the hips straight down, landing with the feet in the correct position, the torso held upright throughout, and maintaining the stick over the shoulders with the elbows fully locked. Once the lifter is performing this exercise correctly with a stick, he/she can begin practicing, after warming up with the stick, with a light bar.

Once the lifter has mastered this last version of the footwork exercises, he/she is ready to attempt a complete jerk (assuming he/she has been doing some practice in the power jerk that is described below). Most lifters who have mastered this last footwork exercise find learning the jerk a very simple task. Therefore, the importance of practicing this exercise regularly and with care cannot be overemphasized.

It takes at least several workouts, and generally several weeks, of three workouts per week for foot positioning to become consistently good. It is generally a good idea for the lifter to put each foot forward five times in each set with five reps with the right foot forward and five reps with the left foot forward. After a few workouts, it will likely become clear to the lifter and coach which foot for- ward looks and feels best and that is the foot the lifter will likely become clear to the lifter and coach which foot forward looks and feels best and that is the foot the lifter will place forward from then on. If each foot forward looks and feels the same, an arbitrary choice can be made. There seems to be no correlation between right handedness and the right or left foot forward feeling better.

**Recovering (Standing Up) From the Split Position**

Early in this period of practice, it is a good idea to teach the lifter how to stand up from the split position correctly. This is done by taking one step backward with front foot and then taking a step forward with the back foot. This generally brings the feet in line, but if it does not, the lifter can take a small additional backward step with front foot and a small additional forward step with the back foot, in that order.
**How to Miss a Jerk Safely**

While the lifter is mastering his footwork for the jerk, the process of learning how to miss a jerk safely needs to be carried out with a stick.

As was the case for the snatch, the first principle of missing a jerk safely is to always lock the elbows solidly when the bar is put overhead. This is true when performing the exercise with the stick, but it becomes much more important when a heavy jerk is being attempted. The lifter must invariably lock the elbows when jerking, even if that places the lifter in a position where the legs are bent so deeply that a recovery from the split becomes challenging. You must always lock the elbows once you decide to attempt a jerk — period.

The locked elbows are actually required under the rules of Weightlifting, but, more importantly, they afford the lifter a crucial safety element. As was noted in discussing the snatch, when the elbows are locked, the barbell cannot hit the head, neck, shoulders, or torso of the lifter because the very length of the arms keeps the bar away from these areas. As soon as the elbows bend, the lifter is not only in a weaker position, but the bar can fall on these areas as rare as that is.

In contrast, if balance or control of the bar overhead is lost, when one is attempting a jerk, but the lifter maintains the arms in a fully locked position, it is a simple matter to push the bar that is forward even further forward and to pull the front foot back out from under the falling bar. If the bar is being lost rearward, the lifter pushes back on fully locked arms, opens the hands to permit the arms to be pulled forward and away from the bar and at the same time pulls the back leg forward out of the falling path of the bar. Naturally, it is critical that this latter movement be performed immediately after the pushing of the bar forward or back, so that the lower body is out of the way as the bar passes the torso and travels toward the platform.

The lifter should practice missing with the stick, both forward and back, so that when the athlete begins to lift the bar or heavier weights, he will know exactly what to do in the event of a miss. If this is done for a few workouts, the procedure should be learned well enough so as to be carried out automatically in the future. But if the lifter shows any signs of having forgotten how to miss, this procedure should be practiced again.
Dropping the Barbell in a Controlled Manner

It is customary, when bumper plates are being used, for athletes to drop the bar after the completion of an exercise that does not entail using a rack. However, this should not be done in a completely uncontrolled manner. The bar should always be dropped in front of the lifter and never propelled downward by the lifter. Before dropping the bar, the lifter must assure that the legs are out of the way. Discouraged lifters sometimes drop the bar from a squat position without assuring that their legs are out of harm’s way. They almost invariably get away with it, but a completely unnecessary disaster can occur when uncontrolled missing is done, as the bar can fall several feet and contact a leg or knee that is fixed in place by the foot. Therefore, new lifters should be taught to push the bar well forward at the outset of the intentional dropping motion.

Athletes should also be sure to release the hands from the bar well before the barbell hits the platform (at least when the bar reaches waist height), and no body part should be above the bar when this happens. Bumper plates can cause a barbell to bounce upward quite forcefully when it first hits the platform, and the lifter does not want to be the recipient of any of that force.

Power Jerk

While the lifter is learning footwork, he/she can become comfortable with driving the bar overhead in the jerk by practicing the power jerk. This method of jerking is actually used by a very small percentage of top athletes to execute their jerks in competition. However, both consistency and the ultimate amount of weight that can be lifted with this style is generally significantly less than with the split jerk. So the vast majority of athletes use the split style.

The lifter begins the power jerk with the bar held on the chest and shoulders in the same way that it would be held for a front squat. The bar rests primarily on the shoulders, the elbows are at the height of the shoulders and slightly lower, the chest is elevated with the torso in the universal weightlifting posture, and the athlete’s balance is shifted toward the rear of the foot. In addition, in order to assure a clear path for the bar to be driven overhead, it is important that the head be pulled back slightly and chin tucked in.
From this position, the legs are bent smoothly within the knees traveling forward over the toes. The torso is strictly upright, hips directly below the shoulders, and above the middle to rear of the feet. When the athlete has lowered the bar approximately 10% of his height, this downward “dip” ceases crisply and the lifter drives the bar upward explosively with the legs. As soon as this explosive impulse is delivered to the bar, the lifter rebends his legs at least to the point to which they were bent in the dip, and generally more, while the arms push upward against the bar, driving the body downward under the bar and locking the arms out rapidly.

**Progressions in the Power Clean and Power Snatch**

We will now move on to an explanation of the critical “progressions” that the USAW recommends to teach the power snatch and power clean, which are taught before the squat snatch and squat clean. It should be noted that there are other effective means for teaching lifters how to perform the snatch and clean, but these progressions have proven to be very effective. Some coaches prefer to teach the power clean first, while others prefer teaching the power snatch first. Many teach both more or less simultaneously. All of these approaches can work effectively, if the athlete learns each step well before moving on to the next progression.

Both the snatch and clean progressions involve learning how to pull the bar upward explosively from the power position first. Then the lifter learns how to pull from mid-knee to and continuously through the power position and explosively upward. Finally, the athlete learns how to pull from the floor, to and through the mid-knee position, and through the power position to explosively launch the bar upward. It should be noted that it is not unusual for lifters to need interim steps between these three progressions as well as the three progressions. That is fine, but many lifters will be able to learn using just the three progression steps.

If the lifter is jerking with the stick correctly, he/she can move on by doing it with the empty bar. Some lifters will find it easier to do the jerk correctly with the weight of the bar than when they use the stick. But if technique breaks down with the bar, go back to the stick or use a lighter bar until the lift is mastered with that weight.

The majority of lifters will do this reasonably correctly on the first try, if and only if they have mastered the footwork exercises. Nonetheless, it is a good idea to have the athlete execute several sets using the footwork first, and then the regular jerk sequence. Once the athlete is performing the split jerk correctly, the initial footwork can be eliminated from the set and the athlete can simply practice the jerk. However, it is always a good idea during at least the first weeks and months of practicing the regular jerk to do a few warm up sets with the footwork exercise before jerking. If the athlete’s footwork begins to deteriorate while he/she is practicing the jerk, some practice on the footwork should be introduced again.
Power Snatch

Learning the power snatch is a key step in learning the full squat snatch, but it is also an exercise used by many advanced weightlifters and athletes in other sports to build explosive power. In addition, many athletes find it easier to understand the power position in the snatch than the clean because the leg bend in the snatch power position is more profound. Finally, it is relatively rare for an athlete to have a hard time holding a bar overhead with a snatch grip, while a fair percentage of athletes find it hard to rack a clean correctly at the outset. So many coaches prefer to begin teaching lifters the power snatch before the power clean. Either method can work well.

Remember that while the power snatch is taught in segments or progressions, when the full lift is performed, the bar is lifted from the floor overhead in one continuous motion.

Selecting the Correct Snatch Grip Width

To prepare to learn the first progression in the power snatch, the athlete lifts the bar from the floor with the hands in place in a snatch width grip and evenly spaced from the center of the bar. Most bars have smooth rings on either side of the bar between the center of the bar and the bars built-in collars (which prevent the plates from sliding inward toward the lifter), so the hands can easily be equally spaced, relative to the center of the bar. The lifter stands fully erect with the knees locked and elbows locked with the bar hanging straight down and in contact with the tops of the thighs. The torso is in the universal position with the chest inflated and up, and the arms and shoulders are relaxed. The feet are approximately hip width apart, flat on the floor, and they can be parallel or have the toes turned out somewhat (the latter is generally the case in the snatch).

What is the correct “snatch width” for the hands? Many guides to grip width exist, but perhaps the simplest and most frequently accurate method have the lifter, while standing in the position described in the paragraph above, move the hands in or out, equally on both sides, until the bar is at the height of the juncture of the hip joint and thighs. When the lifter bends the knees into the power position and the torso remains upright, the bar should lie across the tops of the thighs. That is the correct default snatch grip, so please have the lifter make a mental note of where it is, so that it can be assured the lifter can replicate that grip width consistently going forward. The only additional test, which in most cases will be easily passed, but should nevertheless be done, is to lift the bar overhead with the grip just identified. When the arms are locked overhead, the bar should clear the head by several inches. If the bar does clear the head adequately, retain the grip identified. If it does not, bring the grip in by the same amount on both sides until the bar clears the head by several inches and use that grip as the default.

It should be noted that the wider the grip, the smaller is the distance the lifter has to pull the bar from the power position to the overhead position. But a wider grip makes it more challenging for the lifter to assume a correct position from the floor and places more stress on the wrists, shoulders, elbow joints, and sometimes the grip. In view of all of these factors, the grip width may need to be adjusted later on, for a variety of reasons, but at the outset, these two simple tests of resting on the tops of the thighs and clearing the top of the head with inches to spare will be more than sufficient.
Power Snatch (PS) from The Power Position – Tops of the Thighs

The athlete begins this exercise with the bar in the hands, the arms relaxed and straight, the torso in the universal posture and nearly upright and the legs straight, with the feet flat on the floor at hip width and toes turned out slightly. Keeping the torso upright or permitting it to tilt slightly forward, the lifter bends the knees until the legs are well bent and the bar is lying across the tops of the thighs at their juncture with the hip joint. The balance at this point is over the middle of the foot (the bar shouldn’t be permitted to slide down the thighs, or the torso to bend forward materially, at this stage, but the torso shouldn’t lean back either).

Now the lifter drives up explosively with the legs and shrugs the shoulders to make the bar jump upward toward the shoulders and head. The arms are not used at all to raise the bar. They are held completely relaxed and simply connect the torso to the bar, but they will bend as the bar is launched upward because they are completely relaxed and offer no resistance to the upward progress of the bar. The bar stops touching the thighs as soon as the upward explosion nears completion, but remains very close to the body, nearly touching it as the bar begins to travel upward.

Note again that in the power snatch from the power position, the back is not doing the lifting, but rather it is the upward thrust of the legs and the shrugging of the shoulders. The torso has not leaned forward much, if at all, and it should not lean back very much at the end of the explosion. It is the legs that do the majority of the work in this exercise. They bend to lower the bar and extend to raise the bar. The muscles of the back do very little work, except to stiffen the torso, and the arms do virtually no work, during the pulling motion from this position.

It is generally useful to have the lifter perform several sets of simply exploding upward with the legs and shoulders to throw the bar or make the bar jump upward and toward the shoulders before the athlete attempts an actual power snatch. Once the bar is jumping upward fluidly, the lifter may actually attempt to catch the bar on straight arms overhead, to actually power snatch it.

Many lifters understand this motion best when it is described as a throw and catch. In other words, they are throwing the bar upward explosively with the legs and shoulders, and as the bar takes off upward, they jump down into a quarter overhead squat position while flipping the wrists around to catch the bar on straight arms overhead. Others find the analogy of jumping up with the bar to be helpful in understanding what they must do, as long as this does not result in the lifter actually jumping up materially from the platform. The lifter should drive up as fast as possible with the legs and shoulders, then drop down into the quarter squat quickly to catch the bar with the wrists turned back and the elbows fully locked and the bar overhead. The shoulders should be directly under the bar in the receiving position for the snatch, but the bar
can be slightly toward the rear of the shoulders. The torso is upright, or leaning slightly forward, when the bar is caught overhead (the body never leans backward in the catch).

The torso is strictly vertical or leaning forward somewhat in the receiving position, but it should never be leaning back and the bar should never be forward of the head or shoulders. When the bar is caught overhead, it should be over the center of the athlete’s feet. When the lifter moves under the bar to catch it, he/she should move straight down under the bar, neither jumping forward nor backward materially (less than an inch or so), if at all. Jumping forward generally results from the lifter being balanced toward the toes when the exercise begins. Jumping backward suggests the weight is shifted toward the heels at the start. Both of these are to be avoided.

Most lifters jump or slide the feet outward slightly when they catch the bar overhead. This is desirable, but the feet should not go wider than the stance the lifter assumes in the over-head squat, as a very wide stance can put excessive stress on the hips and knees and preclude the lifter from assuming a correct deep squat position, which will be a future goal in the snatch progression. However, many lifters will have a somewhat wider foot position in the snatch than clean.

After the bar is caught overhead, the lifter stands up until the legs are locked, lowers the bar back to the start position of the exercise, takes a breath, and re-inflates the chest to repeat the exercise. Sets of five repetitions usually work best with the bar or stick, as the lifter gets plenty of practice per set but does not fatigue to the point where coordination begins to break down, which will tend to happen with higher repetitions, even with light weights.

Some lifters will need several workouts just to learn to throw the bar up to the area of the shoulders without pulling with the arms, while others will get the idea rather quickly and can move on to the actual power snatch after a few reps or sets of practice with throwing the bar upward. New lifters should be comforted by the fact that there is virtually no correlation between how quickly they learn a motion and how well they ultimately learn it.

It should be noted that the purpose of this step in the power snatch progression is to teach the lifter to explode vertically using the muscles of the legs and hips, not the arms and back, and to catch the bar correctly overhead, with the torso upright or leaning slightly forward, the arms fully locked, the bar directly above the shoulders, and the legs bent.

Lifters generally need to practice each step until it is being done correctly, before they can move on to the next. But if a lifter has been diligently practicing a certain step in a progression for a number of workouts and is experiencing great difficulty with doing it correctly, it is possible that moving on to the next step (or half step is described in a later section that presents supplementary exercises 1.5 and 2.5) can help. But unless the move on to a later step in the progressions results in better performance almost immediately, it is best to return to the prior step and work on it until it is being done correctly. Returning to a prior step can also help when a lifter is having trouble with a later step in the progression, or even when he is not, can be useful to remind an athlete of the correct motion in that earlier phase of the lift.
Common Errors in the Power Snatch (PS) From the Power Position and Remedies

There are several errors that are commonly made by beginners who are learning the power snatch from the power position (tops of the thighs):

1) **Balance and Positioning** – Balancing on the toes or heels at the outset. If the lifter does the former, he/she will tend to throw the bar forward at the end of the pull which requires a jump forward to catch the bar. In the latter case, the lifter will tend to jump back. Jumping forward or back significantly hurts consistency because it requires both the bar and the lifter to go forward or backward to the same degree, thus adding variables to a situation, (in contrast to a straight upward pull, which would not add such variables. But driving forward or backward materially results in energy that could have been used for a purely vertical thrust being dissipated in a horizontal direction that has no practical value. To correct this, make sure the bar is over the middle of the foot at the outset of the upward pull and that the lifter feels the balance on the middle of the foot. Some top lifters rise on the toes in their power positions, but their balance is not toward the toes. In terms of positioning, some lifters will incorrectly position the shoulders well in front of, or behind, the bar at the start of the exercise, instead of directly above or slightly forward of the bar. This is generally corrected merely be giving the lifter feedback about his position.

2) **Back Whip and/or Forward Hip Thrust** – Instead of keeping the torso essentially upright during the explosion. Some lifters do indeed lean the torso back while exploding from the power position. While a mild leanback is not a concern, leanback that is substantial is a waste of energy, can misdirect the bar horizontally, and increase the time it takes for the lifter to move from the extended position reached at the end of the pull to the catch position. A forward hip thrust in which the hips go over the toes or even further forward, which can occur together with a leanback, or separate from it, also wastes energy, can misdirect the bar, and delay the process of going under the bar to receive it. So both of these errors are to be avoided. To correct either these problems, encourage the lifter to drive the hips and shoulders up at the finish of the pull, not forward or back, and assure that the balance at the outset of the pull is correct. Continuing to pull up on the bar after the legs have been fully extended can also cause leanback or forward hip thrust and this can be corrected by having the athlete move under the bar slightly earlier.

3) **Bending the Arms While Pulling the Bar** – Some lifters will bend the arms as they straighten the legs and shrug the shoulders at the top of the pull. Consciously, or at least subconsciously, they think that the bar goes up, at least in part, because the arms pulls it up. This is completely wrong. The arms play an important role in helping to pull the body under the bar, after the body has been extended, and in pushing upward on the bar as the athlete is working to catch it overhead, but the arms are not pulling up during the explosion phase of
the pull. This problem must be addressed immediately as it is a hard habit to break once it is ingrained. Corrective measures include having the lifter relax and extend the arms at the outset and focus on leg explosion and shoulder shrug as well as practicing a few reps of shrugs with a leg thrust before trying the power snatch in a given set. Another important corrective measure is to have the lifter focus on jumping down into the quarter squat, turning the wrists quickly and locking the elbows fully into a lockout with the bar overhead a little earlier in the exercise sequence (i.e., ending the pull sooner and dropping into the catch position sooner).

4) **Poor Catch Position** – The lifter leans back, fails to lock the elbows fully, does not bend the legs sufficiently, or jumps the feet too wide in catching the bar overhead. To correct these errors, feedback on the position of the torso, which should be vertical or leaning slightly forward, armlock (the arms should be fully straight with the wrists back), an overhead squat width and depth of a quarter squat must be achieved.

**Power Snatch from Mid Knee Height**

Once the lifter can perform the snatch from the power position correctly, it is appropriate to move on to the next step in the progression, the power snatch from mid-knee. Remember that the lifter should generally not progress to the next step until the prior step has been mastered.

This exercise begins the same way as the power snatch from the power position as the lifter raises the bar until the legs are fully straight and the torso is upright; the arms are straight and the bar rests against the thighs. The lifter now lowers the bar to the power position using only the legs as he/she did when practicing from the power position. Once the bar reaches the power position, a major change takes place in the pattern of the movement. From this point downward the legs stop bending and simply remain in the bent position. The bar is lowered from that position solely by leaning the torso forward and rocking the knees backward until the bar is at mid-knee level and the shins are completely vertical. The shoulders are in front of the bar when the bar is at knee level, and the bar is over the athlete’s instep. The balance is still in the middle of the foot or slightly toward the heels, and the feet are flat on the floor. During this entire process, the knees have simply remained bent to the same degree that they were when the bar was in the power position or even more. They have just rocked backward. The bar slides down along the full length of the thighs when it is lowered.

From this position, the lifter simply reverses what he/she did to lower the bar to mid-knee level. The torso is brought to an upright position while the knees shift forward and down the bar slides upward along the full length of the thighs until the bar is again at the power position. At this point the lifter continues upward to proceed through the power position and throw the bar upward, as was done in the power snatch from the power position, then catches it overhead.
Many lifters will find it useful to simply practice the rocking motion several times in succession for a few sets. That is to say the bar is lowered by the torso while the knees rock backward until the shins are upright. Then the lifter recovers the power position by straightening the torso and moving the knees forward in front of the bar. The key is for the lifter to tilt the torso forward and rock the knees back to lower the bar to mid-knee, then to simply reverse that motion to return to the power position while gliding the bar along the thighs or lightly touching them throughout the motion. Once this concept has been grasped and the rocking motion is being performed correctly, the lifter can proceed to the full power snatch from mid-knee. Often, simply by stressing that the shoulders should be driven or pulled straight up, once the bar has reached the mid-knee position, the correct movement pattern is attained.

**Common Errors in the Power Snatch From Mid-Knee and Their Correction**

There are several errors that are commonly made by beginners who are learning the power snatch from mid-knee. They can be similar to the ones that were previously identified for the power snatch from the power position. These occur for much the same reasons and are corrected in much the same way. However, a number of different errors can arise as well:

1) **Balance** – Balancing on the toes, or too far back on the heels at the outset. If the lifter does the former, you will tend to see the shoulders excessively in front of the bar and the legs may be straighter when the bar is at the knees than it was in the power position. From this position the lifter may either drive the bar and body forward with a resulting jump forward, or straighten the back faster than usual. Either of these mistakes will lead to a misdirection of the bar and place the body in a poor position for the explosion phase of the pull. When the weight is too far on the heels at mid-knee, it causes the lifter to lose his balance backwards, this will result in the bar moving backward. A backward jump will then be required to catch the bar, with all of its disadvantages. To correct this error, make sure the bar is over the middle or only modestly toward the rear of the foot at the outset.

2) **Shins Are Leaning Forward or the Shoulders Are Directly Above the Bar** – This position is very common and very problematic because it forces the bar away from the body and makes it very difficult to bring the bar into a correct power position. To correct this, assure that the lifter has the shoulders well forward of the bar and the shins upright when the bar is at mid-knee level. This problem is relatively easily corrected by placing the lifter in the correct positions with a light weight and making sure balance is toward the middle, or slightly toward the rear middle of the foot.

3) **Legs Are Straightened With the Torso At the Outset of the Movement** – During the proper execution of this exercise, the torso straightens first and the knees move forward of the bar until the power position is reached and only then are the legs straightened. In practice, many lifters will bend the knees more as the torso is straightened while moving into the power position (which is referred to as the “double knee bend”). Every effort should be made to assure this does not happen and that the lifter straightens the torso, at least somewhat, before the legs begin to straighten. Corrective measures include having the lifter practice straightening the torso while rocking the knees under the bar or thinking of...
pulling or driving the shoulders straight up. However, care must be taken to assure the lifter does not go beyond a torso upright position when the bar reaches the power position i.e., by continuing to drive the hips forward after the bar has reached the tops of the thighs position, or by leaning the torso back excessively before or during the explosion phase of the pull.

Once the lifter has mastered the power snatch from the mid-knee position, he/she is ready to begin learning the power snatch from the floor, which is the ultimate goal of the power snatch progression.

**Power Snatch From the Floor**

This exercise begins in the same way as the previous two. The lifter is standing erect with the torso upright and the legs locked. The lifter lowers the bar as before by first bending the legs to get the bar into the power position and then leaving the legs bent and inclining the torso forward; with the lifter rocking the knees back to reach the mid-knee position.

Now, the lifter continues to lower the bar with it scraping lightly along the shins, or just missing the shins, but staying very close to them, solely by bending the legs, while the angle of the torso in relation to the floor remains the same throughout the process of lowering the bar to the floor. The lifter is essentially doing a squat with the bar held in the hands. Note that this movement is almost the opposite of what was done in lowering the bar from the power position to the mid-knee position, where the torso inclined forward, changing its angle in relation to the floor significantly, but the angle at the knees, the degree of leg bend, remained the same or increased. In contrast, in lowering the bar to the floor, it is the angle of the knee that changes while the angle of the back in relation to the floor does not. The bar is lowered until it touches the floor. At this point, also in contrast to the mid-knee position, the shins are tilting well forward, the bar is over the base of the toes instead of the instep, and the shoulders are directly above or only slightly forward of the bar.

Now the lifter simply reverses the process by using the legs, not the back, to raise the bar until it is back to the mid-knee position and from which point it proceeds upward to complete the power snatch as he did in the power snatch from mid-knee.

The lifter may benefit from practicing the lowering of the bar from mid-knee to the floor and raising it back to mid-knee again for a few sets in order to get the idea of this motion before a full power snatch is attempted. The biggest challenges faced by lifters in learning this exercise are typically learning to use only the legs to lower the bar to the platform and to raise it to mid-knee position again, while maintaining the universal torso position throughout. Many lifters find it difficult to maintain the lower back arch and not round the upper back as they lower the bar to the floor.

As soon as the lifter is performing this exercise correctly by lowering the bar to the floor then reversing direction as described, the lifter can begin to pause with the bar on the floor and then continue lifting the bar from the floor with no preliminary lowering process. At this point, the lifter, assuming he has mastered the overhead squat, is ready to begin a fairly quick transition to learning the full squat snatch, a process that will be described in some detail shortly.
Common Errors in the Power Snatch From the Floor and Their Correction

The single most common error when power snatching or snatching from the floor is the failure to use the legs exclusively when raising the bar from floor to knee height. When the legs are used properly and exclusively, the torso angle when the bar reaches knee height remains the same relative to the floor as it was when the bar was on the floor, which means the shoulders and hips moved upward at the same rate. At the same time the shins move from leaning forward at the start to being vertical by the time the bar has reached knee level.

Instead, many lifters try to straighten the torso as the bar is raised from the floor to knee level. This erroneous action leads to many subsequent errors, perhaps the foremost of which is preventing the bar from moving to a position over the middle of the foot as the bar reaches knee height, because the knees are still tilting forward when the bar reaches the level of the knees, keeping the bar away from the body. The opposite error is to lift the hips faster than the shoulders as the bar moves from floor to knee (a lifter who does this will be forced to rebend the knees considerably, later in the pull, to get into a good power position).

There are a number of effective ways to deal with this error. One is to have the lifter assume the correct position when the bar is at knee level, and then lower the bar to the floor solely by the bending legs. This will generally result in the shins bending forward as the legs themselves bend. The goal should be to end with the bar on the floor and directly above the base of the toes and the shoulders directly above, or slightly forward, of the bar.

Progressing From the Power Snatch and Power Clean to the Full Squat Snatch

Most lifters who have become comfortable with the power snatch and overhead squat will find the transition to full squat snatches is achievable with some practice. Lifters generally proceed to learn the squat snatch by warming up with power snatches with a moderate weight, each rep immediately followed by an overhead squat. Then the lifter tries to catch the bar progressively lower in the power snatch until, over a series of reps, sets, or workouts, the lifter is catching the bar in the full squat position. The lifter must be careful to keep the elbows locked on each snatch during this process. Some lifters will be able to manage squat snatching with light weights during the first workout they try it; most will be able to do it reasonably and comfortably within a few workouts, assuming the athlete has mastered the power snatch progressions and overhead squat prior to attempting the transition to the full squat snatch. But it will often take a while for the athlete’s squat snatch to approach and then surpass the athlete’s power snatch, although ultimately it should do this by 15 to 25%.

Lifters who have mastered overhead squats and power snatches, but are having trouble with the above described process after trying for several workouts, the snatch balance variations described later in this manual will often prove to be helpful.

Power Clean

Learning the power clean is a key step in learning the full squat clean, but it is also an exercise used by many advanced weightlifters and athletes in other sports to build explosive power. As was the case for the power snatch, the power clean is taught in three steps, the first being the power clean from the power position.
Power Clean from the Power Position – Mid-Thigh

The athlete begins this exercise by holding a stick or bar in his/her hands with a shoulders’ width opposing grip, the legs straight and the torso strictly upright and the arms relaxed and straight. The feet are approximately hip width apart, flat on the floor, and can be parallel or have the toes turned out somewhat. Keeping the torso upright, or permitting it tilt slightly forward, the lifter bends the knees until the bar touches approximately the middle of the thighs. The balance at this point is over the middle of the foot.

Now the lifter drives up explosively with the legs and shrugs the shoulders to make the bar jump upward toward the shoulders. The arms are not used at all to raise the bar. They are held completely relaxed and simply connect the torso to the bar. They will ultimately bend as the bar is launched upward because they are completely relaxed and offer no resistance to the upward progress of the bar. The bar stops touching the thighs as soon as the upward explosion begins but remains very close and nearly touching the body as it travels upward.

Note that the back is not doing the real lifting here, but it is rather the upward thrust of the legs and the shrugging of the shoulders. The torso has not leaned forward materially, and it should not lean back materially either. It is the legs that do the majority of the work in this exercise. They bend to lower the bar, and they extend to raise the bar. The muscles of the back and arms do virtually no work other than helping to transmit the force generated by the legs and hips to the bar.

It is generally useful to have the lifter perform several sets, or at least reps, of simply exploding upward with the legs and shoulders to throw the bar or make the bar jump upward toward the shoulders before the athlete attempts an actual power clean. Once the bar is jumping upward fluidly, the lifter may actually attempt to catch the bar on the shoulders or “rack” it.

As was the case in the snatch, many lifters understand this best when it is described as a throw and catch. In other words, they are throwing the bar upward explosively with the legs and shoulders, and as the bar takes off upward, they jump down into a quarter front squat position, while flipping the elbows around from above the bar to in front of the shoulders to catch the bar on the shoulders. Others find it helpful to think of jumping with the bar during the pull. As long as this does not result in actually jumping up off the platform materially, this is fine.

In the receiving position for the clean, the bar is resting on the shoulders as it does in the front squat, and the torso is strictly vertical or slightly leaning forward but never leaning back. When the bar is caught on the shoulders, it should be over the center of the athlete’s feet. When the lifter moves under the bar to catch it, he/she should not jump forward or backward any more than very slightly, less than an inch, if at all. Jumping forward generally results from the lifter being balanced toward the toes when the exercise begins. Jumping backward suggests the balance is shifted toward the heels at the start. Both of these are to be avoided.

After the bar is caught on the shoulders, the lifter stands up until the legs are locked, takes a breath, lowers the bar/stick to the starting position, and assumes the universal posture with the torso upright, to prepare of the next repetition of the exercise. Sets of five repetitions usually work best with the bar or stick, as the lifter gets plenty of practice per set but does not fatigue to the point where coordination begins to break down, which will tend to happen with higher repetitions with even a fairly light weight.
Some lifters will need several workouts just to learn to make the bar jump upward even with fairly light weights, while others will get the idea rather quickly and can move on to the actual power clean after a few sets of practice with throwing the bar upward.

For lifters who simply cannot fathom how to throw the bar without actively using (pulling the bar upward with) the arms it is often helpful to have the lifter explode downward into a quarter squat immediately after extending the body to finish the pull. Some lifters may actually find it easier to do the movement correctly when they jump into a half squat or even lower; as thinking about squatting down seems to distract them from wrongly thinking about pulling the bar up with the arms. However, if this approach is taken, care must be taken to have the lifter rack the bar with the elbows at shoulder level to assure the elbows are well above the knees in the squat position.

Most lifters jump or slide the feet outward slightly after the explosion in the pull, when they rack the bar. This is fine, but the feet should not go wider than the stance the lifter assumes in the front squat, because a wide stance can put too much stress on the hips and knees and eventually preclude the lifter from assuming a correct deep squat position, which will be a future goal in the clean progression. A front squat width is the appropriate one.

It should be noted that the purpose of this step in the power clean progression is to teach the lifter to explode vertically using the legs and hips, not the arms and back, and to rack the bar quickly with the elbows up and the torso vertical and on bent legs. As was noted in the discussion of the power snatch, if the lifter has persistently worked on a step in the progression and is having trouble mastering it, in some instances moving on to the next step in the progression to see if the lifter actually performs a fuller version of the exercise better is worth trying (e.g., from the lower thigh or mid-knee). If this does not work, and it only does in the minority of cases, the lifter needs to keep working on the earlier step in the progression until it is performed correctly.

### Common Errors in The Power Clean (PC) From Mid-Thigh and Remedies

There are several errors that are commonly made by beginners who are learning the power clean from mid-thigh (not surprisingly, they are similar to the common errors made while learning the power snatch from the power position):

1) **Balance and Positioning** – Balancing on the toes or heels at the outset is a common mistake. If the lifter does the former, he/she will tend to throw the bar forward at the end of the pull, thus requiring a jump forward to catch the bar. In the latter case (balance on the heels), the lifter will tend to jump back. Jumping forward or back significantly hurts consistency in that it requires both the bar and the lifter to go forward or backward to the same degree, adding to variables to a situation where a straight upward pull would include no such variables. But it also means that energy that could have been used for a purely vertical thrust is being dissipated in a horizontal direction that has no practical value. To correct this, make sure the bar is over the middle of the foot at the outset of the upward pull and that the lifter feels the balance on the middle of the foot. In terms of positioning, some lifters will incorrectly position the shoulders well in front of, or behind, the bar at the start of the exercise, instead of directly above or slightly forward of the bar. This is generally corrected merely be giving the lifter feedback about his position.

2) **Back Whip and Forward Hip Thrust** – As was the case in the power snatch, instead of keeping the torso essentially upright during the explosion, some lifters lean the torso back while exploding from the power position. While a mild lean back is not a concern, leanback that is substantial is a waste of energy, can misdirect the bar horizontally, and increase the time it takes for the lifter to move from the extended position reached at the end of the pull to the catch position. A forward hip thrust in which the hips go over the toes or even further forward, which can occur together with a leanback, or separate from it, also wastes energy,
can misdirect the bar, and delay the process of going under
the bar to receive it. So both of these errors are to be avoided.
To correct either these problems, encourage the lifter to drive
the hips and shoulders up at the finish of the pull, not forward
or back, and assure that the balance at the outset of the pull
is correct. Continuing to pull up on the bar after the legs have
been fully extended can also cause lean back or forward hip
thrust and this can be corrected by having the athlete move
under the bar slightly earlier.

3) **Bending the Arms While Pulling the Bar** – Some lifters will
bend the arms as or before they straighten the legs and shrug
the shoulders at the top of the pull. Consciously, or at least
sub-consciously, they think that the bar goes up, at least in
part, because the arms pull it up. This is completely wrong.
The arms play an important role in helping to pull the body
under the bar after the pull has been completed and the
athlete is working to move under the bar and rack it on the
shoulders, but the arms are not pulling up during the explo-
sion phase of the pull.

This problem must be addressed immediately as it is a hard
habit to break once it is ingrained. Corrective measures in-
clude having the lifter relax and extend the arms at the outset
and focus on leg explosion and shoulder shrug as well as
practicing a few reps of shrugs with a leg thrust before trying
the power clean in a given set. Another important corrective
measure is to have the lifter focus on jumping down into the
quarter squat and turning the elbows to rack the bar on the
shoulders a little earlier in the exercise sequence i.e., ending
the pull sooner and dropping into the catch position sooner.

4) **Poor Rack Position** – Here the lifter leans back, fails to raise
the elbows high, does not bend the legs sufficiently, or jumps
the feet too wide in catching the bar at the shoulders. To cor-
correct these errors, feedback must be provided to help the ath-
lete learn the correct position of: a) the torso, which should be
vertical or leaning very slightly forward, b) the elbows, which
should be at the height of the shoulders or slightly below, c)
foot width, which should be front squat width, and, d) squat
depth, which should be approximately a quarter squat.
Power Clean from Mid Knee Height

Once the lifter can perform the clean from mid-thigh correctly, it is appropriate to move on to the next step in the progression, the power clean from mid-knee. This exercise begins the same way as the power clean from the power position, with the torso upright and the lifter lowering the bar to the power position by bending the legs, as was done when he/she was practicing the clean from the power position.

However, once the bar reaches the power position, a major change takes place with the pattern of movement. From this point onward the legs stop bending and simply remain in the bent position, while the bar is lowered to the mid-knee position solely by leaning the torso forward and rocking the knees backward, until the bar is at mid-knee level and the shins are completely vertical. By the time the bar is at the mid-knee position, the shoulders are in front of the bar and the bar is over the athlete’s instep. The balance is still in the middle of the foot or slightly toward the heels and the feet are flat on the floor. During this entire process, the knees have remained bent to the same degree that they were when the bar was in the power position and have simply rocked backward so that the shins are upright instead of leaning forward. The bar slides down along the lower thighs when it is lowered, until it reaches mid-knee position.

From this position, the lifter simply reverses what he/she did to lower the bar to the mid-knee level. That is the torso is brought to an upright position while the knees shift forward and the bar slides up along the thighs until the bar is again at the power position, at which point the lifter continues upward to proceed through the power position and throws the bar upward as was done in the power clean from the power position to catch it on the shoulders.

As was the case in learning the power snatch from the mid-knee position, the lifter may find it useful to simply practice the rocking motion several times in succession for a few sets. That is to say the bar is lowered by the torso while the knees rock backward until the shins are upright, then the lifter recovers the power position by straightening the torso and moving the knees forward in front of the bar. The key is for the lifter to tilt the torso forward and rock the knees back to lower the bar to mid-knee, then to simply reverse that motion to return to the power position while gliding the bar along the thighs or lightly touching them throughout the motion. Once this concept has been grasped and the rocking motion is being performed correctly, the lifter can proceed to the full power clean from mid-knee. Often, simply by stressing that the shoulders should be driven or pulled straight up, once the bar has reached the mid-knee position, the correct movement pattern is attained.
Common Errors in the Power Clean From Mid-Knee and Their Correction

There are several errors that are commonly made by beginners who are learning the power clean from mid-knee. A number of these are similar to the ones as were identified for the power clean from mid-thigh. That is because they occur for essentially the same reasons and are incorrect in the same way. However, a number of additional errors can arise as well:

1) Balance – Balancing on the toes or too far back on the heels at the outset. If the lifter does the former, you will tend to see the shoulders excessively in front of the bar and the legs may be straighter when the bar is at the knees than they were in the power position. From this position, the lifter may either drive the bar and body forward with a resulting jump forward, or straighten the back faster than usual. Either of these mistakes will lead to a misdirection of the bar and place the body in a poor position for the explosion phase of the pull. When the weight is too far on the heels at mid-knee, it may be slightly further toward the heels than it was at the beginning of the power position, but if the balance is too far back, it causes the lifter to lose his/her balance backward as the pull proceeds, and a backward jump will be required, with all of its disadvantages. To correct this, make sure the bar is over the middle or only modestly toward the rear, of the foot at the outset.

2) Shins Are Leaning Forward or the Shoulders Are Directly Above the Bar – This position is very common and very problematical in that it forces the bar away from the body when it is at mid-knee level and this makes it very difficult to bring the bar into a correct power position. To correct this error, assure that the lifter has the shoulders forward of the bar and the shins upright when the bar is at mid-knee level. This problem is relatively easily corrected by placing the lifter in the correct position with a light weight and then having the lifter execute the lift.

3) Legs Are Straightened Together With the Torso at the Outset of the Movement – During the proper execution of this exercise, the torso straightens first and the knees move forward of the bar until the power position is reached. Only then are the legs straightened. In fact, many lifters will bend the knees more as the torso is straightened and while moving into the power position — a phenomena which is often referred to as the “double knee bend”. Every effort should be made to at least assure that the legs do not straighten initially and that the lifter straightens the torso, at least somewhat, before the legs begin to straighten. Corrective measures include having the lifter practice straightening the torso while rocking the knees under the bar. However, care must be taken to assure the lifter does not go much beyond a torso upright position when the bar reaches the power position by continuing to drive the hips forward after the bar has reached the mid-thigh position or by leaning the torso back excessively before or during the explosion phase of the pull.
Once the lifter has mastered the power clean from the mid-knee position, he/she is ready to begin learning the power clean from the floor, which is the ultimate goal of the power clean progression.

**Power Clean From the Floor**

This exercise begins in the same way as the previous two. The lifter is standing erect with the torso upright and the legs locked. The lifter lowers the bar as before by first bending the legs to get the bar into the power position. Then, leaving the legs bent, the lifter inclines the torso forward while rocking the knees back to reach the mid-knee position.

Now, the lifter continues to lower the bar with it scraping lightly along the shins, or just missing the shins but staying very close to them, solely by bending the legs, while the angle of the torso in relation to the floor remains the same throughout the process of lowering the bar to the floor. The lifter is essentially doing a squat with the bar held in the hands. Note that this movement is almost the opposite of what was done in lowering the bar from the power position to the mid-knee position. During that stage, wherein the torso inclined forward, changing its angle in relation to the floor significantly, but the angle at the knees (the degree of leg bend) remained the same. In contrast, in lowering the bar to the floor, it is the angle of the knees, and shins in relation to the floor, that changes, while the angle of the back in relation to the floor does not.

The bar is lowered until it touches the floor. At this point, also in contrast to the bar at mid-knee position, the shins are tilting well forward, the bar is over the base of the toes instead of the instep, and the shoulders are directly above, or slightly forward of, the bar.

Now the lifter simply reverses the process by using the legs, not the back (the back angle in relation to the floor remains the same from floor to mid-knee), to raise the bar until it is back to the mid-knee position, from which point the athlete continues the lift in the way that she did in performing the power clean from mid-knee, to complete the lift. It should be emphasized that during this process the back angle in relation to the floor remains the same from floor to mid-knee, which is to say the shoulders and hips rise at the same rate.

When this exercise is first performed, it is generally best to simply touch the floor without letting it rest there for any length of time and reversing the motion. Once that is being done correctly, the bar can actually be permitted to rest on the floor for a few seconds, and finally the lift is actually begun from the floor instead of lowering it from the top down each rep.

As was the case in learning the power clean from mid-thigh, the lifter may benefit from practicing the lowering of the bar from mid-knee to the floor and back to mid-knee again for a few sets to get the idea before a full power clean is attempted.

The biggest challenges faced by lifters in learning this exercise are typically learning to use only the legs to lower the bar to the platform and to raise it to mid-knee position again and in maintaining...
the universal torso position throughout. Some lifters find it difficult to maintain the lower back arch and not round the upper back as they lower the bar to the floor, but the correct position must be maintained.

As soon as the lifter is performing this exercise correctly by lowering the bar to the floor then reversing direction as described, the lifter can begin to pause with the bar on the floor and then begin lifting the bar from the floor with no preliminary lowering process. At this point, the lifter, assuming he/she has mastered the front squat, is ready to begin a fairly quick transition to learning the full squat clean.

Common Errors in the Power Clean From the Floor and Their Correction

The single most common error when power cleaning or cleaning from the floor is the failure to use the legs exclusively from floor to knee height. When the legs are used properly and exclusively, the torso angle remains the same relative to the floor as it was when the bar was on the floor, and the shins move from leaning forward at the start to being vertical by the time the bar has reached knee level.

Instead, many lifters try to straighten the torso as the bar is raised from the floor to knee level. This erroneous action leads to many subsequent errors, perhaps the foremost of which is driving the knees forward somewhat so that the shins are leaning forward, which prevents the bar from moving to a position over the middle of the foot as the bar reaches knee height.

Fortunately, there are a number of effective ways to deal with this error. One is to have the lifter assume the correct position when the bar is at knee level and then to lower the bar to the floor solely by bending the legs. This will generally result in the shins bending forward as the legs themselves bend. The goal should be to end with the bar over the base of the toes and the shoulders directly above or slightly forward of the bar.

A second approach is to begin with the bar on the floor over the base of the toes with the shoulders directly above or slightly forward of the bar. Then have the lifter practice lifting the bar exclusively with the legs while pulling the shins backward, so that when the bar reaches the level of the knees, the shins are upright. Care must be taken when doing this to assure that the lifter is not almost completely straightening the legs in an effort to bring the shins to an upright position. We are not looking to reach a stiff legged deadlift position when the bar reaches knee level, but rather to have the knees and legs well bent at this point while still having the shins upright. It is often very helpful when performing this exercise to ask the lifter to pause briefly with the bar at mid-knee height to ensure that the correct position at mid-knee has been assumed.

It should be noted that while the lift from the platform in the clean or snatch must occur with the shoulders directly above or slightly in front of the bar, the shoulders should never be behind the bar as this will result in incorrect balance at the start and make it difficult to get the knees out of the way as the bar balance shifts to the front of the foot, which is incorrect, or decrease the angle of the torso relative to the floor too much. This will also place undue stress on the muscles on the muscles of the back and hamstrings.

Progressing From the Power Clean to the Full Squat Clean

Most lifters who have become comfortable with the power clean and front squat will find the transition to full squat clean relatively easy to accomplish. This is done by having the athlete begin with some regular power cleans, with each rep followed by an immediate front squat. On the next set, have the athlete begin with a power clean, followed by an immediate front squat, and as the reps proceed have the athletes try to catch each clean in a progressively lower squat, immediately riding it down into full front squat. For instance, have the athlete catch the first rep in a quarter squat and continue immediately into a full front squat. If that goes reasonably well, have the athlete catch the second rep in a one-third squat and continue immediately into a full front squat. This process proceeds in one set, or across several sets, to the point where the athlete is catching the bar in a near or actual full squat. Naturally, if the athlete is having difficulty with the lower squat, have him keep practicing the power clean and quick transition into the front squat until it gets smoother and smoother, and then move on to catching the bar in a progressively deeper squat. The lifter must be careful to keep the elbows up when catching the clean lower and lower, to assure that the elbows are always well clear of the knees.

Supplementary Exercises

The exercises already described will be sufficient for many lifters to learn how to perform the full squat snatch, the full squat clean, and the full split jerk correctly. However, some athletes and coaches may find it helpful to introduce additional exercises into the training process, to facilitate learning and/or add variety to the athlete’s workouts. However, these exercises are not meant to replace consistent work on the progressions until the progressions have been mastered. Mastery of the progressions is essential whereas practicing the supplementary exercises is not.

Some of the most common additional exercises that are used for conditioning and teaching weightlifting technique are explained in the text that follows. The use of these exercises are part of the judgment process that the coach employees in individualizing programs for each athlete.
Snatch and Clean Progressions 1.5 and 2.5

Many athletes will be able to learn how to execute a power snatch or power clean from the floor using only three steps: 1) lifting from the power position, 2) lifting from the mid-knee position, and 3) lifting from the floor. Other athletes will find additional transitional steps useful.

Power Snatch and Power Clean 1.5

The athlete lowers the bar from the first position in the power snatch or power clean progression (the power position), by leaning the torso forward and rocking the knees back while letting the bar slide down along the thighs, typically to somewhere in the area of the tops of the knees in the clean and perhaps 1/3 up the thigh in the snatch. From this position, the bar is brought back up through the power position where the lift continues on to the power snatch or power clean. Some lifters find it difficult to execute a power clean or power snatch from the pure power position (this is more common in the power clean than the power snatch). These exercises from the 1.5 position will often help such lifters learn essentially the same skills as the PS/PC from the power position.

Power Snatch and Power Clean 2.5

In this exercise, the athlete lowers the bar below the knee, somewhere between the bottom of the knee and mid-shin. This is done by bending the legs and permitting the shins to incline forward somewhat. From this position, the legs lift the bar back up to the mid-knee while the shins are pulled back to an upright position. The lifter then continues on to complete the power snatch or power clean as he/she would from the mid-knee position. During the process of raising the bar back up to mid-knee level, the bar remains close to or in very light contact with the shins. This exercise can be helpful for lifters who are having difficulty learning to do the full lift from the floor, or whose flexibility is such they have a difficult time maintaining the torso in the universal position as they lower the bar all the way to the floor. In this latter case, this exercise can be used until sufficient flexibility to take the bar from the floor correctly has been achieved. A similar exercise can also be performed from blocks which is a piece of equipment that is common in weightlifting gyms but is not covered in this course.

Lift-Offs as a Means to Improve the Floor to Knee Phase of the Pull

When a lifter is having difficulty with lifting the bar from the floor to the knee properly, practicing lifting the bar from floor to knee, either starting from the floor, or lowering to the floor and returning to the knee, can be very helpful. This exercise is called a “lift off”.

In the former version, the lifter begins the lift in the classic start position, with the barbell on the floor and the bar directly over the base of the toes, with the shoulders directly above, or slightly forward, of the bar. Next have the lifter practice lifting the bar exclusively with the legs, so that when the bar reaches the level of the knees it has travelled back toward the lifter’s shins, which are now upright (instead of leaning forward as they were at the start). At this point the bar should be over the lifter’s instep and the shoulders should be well forward of the bar.
Care must be taken when performing this exercise to assure that the lifter is not almost completely straightening the legs as the shins are brought to an upright position. If the legs are straightened to an almost stiff legged position when the bar reaches knee level, it will make it much more difficult for the lifter to achieve a good power position (with the legs well bent) later in the lift. Instead, the goal is to have the knees and legs well bent at this point while still having the shins upright. If the lifter is having trouble achieving this, it may be best to have the lifter begin with the bar at the knees, lower it to the platform using the legs but maintaining tension in the body to support the bar even when it reaches the platform. Then simply have the lifter try to reverse the motion.

It is often very helpful when performing this exercise to ask the lifter to pause briefly with the bar at mid-knee height to ensure that the correct position at mid-knee has been assumed, so that the focus is on correct positioning rather than finishing the deadlift.

If the lifter is able to maintain the universal posture when taking the bar off the floor with a snatch grip, this exercise can be taught at the same time the lifter is learning the power snatch from the power and mid-knee positions, to facilitate learning how to lift the bar to knee level and to condition the muscles to lift the bar from the floor.

If the lifter cannot maintain the correct torso position with a snatch grip, he may be able to do it with a clean grip. In such a case, the lift-off should be performed in that manner until the athlete has developed sufficient flexibility to perform the snatch grip version of this exercise.

Snatch and Clean Pulls

Snatch and clean pulls are replications of the snatch and clean in that the lifter pulls the bar up from the platform with the same style that is used to pull a snatch or clean by generally finishing the pull as explosively as possible, but there is no effort to catch the bar overhead or on the shoulders. Pulls can be performed from the floor or from the various positions in the power snatch and clean progressions.

Athletes practice these exercises both to learn how to pull, as was mentioned earlier during the explanations of some of the progressions, but also to build strength, power, and technique in the pull without performing the full, or even power versions, of the snatch and clean. Lifters and coaches are somewhat divided on the use of pulls for more advanced lifters with some doing many and others doing none at all. The latter lifters tend to do more heavy snatches and cleans instead.

Pulls place less stress on the nervous system and joints, than the full versions of the lifts, since receiving the bar is eliminated for each repetition, but they are less specific than performing the lifts themselves and don’t condition athletes to receive the bar. So pulls represent a trade off in their use.

It should be noted that some coaches use pulls almost exclusively as a means for teaching new lifters how to lift, disavowing the use of power cleans and power snatches altogether. Instead, they have beginners perform overhead squats and front squats to learn the receiving position in the snatch and clean. At the same time they teach pulls from the floor from day one. Alternatively, they use progressions in the pulls themselves, similar to those described...
above for teaching the power clean and power snatch, i.e., pulls from the power positions, pulls from mid-knee, and pulls from the floor. Many have been very successful with this approach. Once the lifter is performing pulls in the same way that she would be performing the pulling phase of snatches or cleans, and overhead and front squats are being well performed, the coach as the lifters combine the pull with an immediate catching of the bar in the squat position.

These coaches argue that teaching the athlete to do the full pulling motion from the outset, instead of top down progressions, avoids the problem of having the athlete learn to string together the progressions and perhaps to hesitate while transitioning from one stage of the pull to another such as floor to knee or knee to power position. Teaching complete pulls, but pulls only from the outset, enables the athletes to focus exclusively on the pulling motion without having to worry about catching the bar on the shoulders or overhead on locked arms. As was noted above, the athlete is at the same time practicing overhead and front squats to learn the receiving position. Learning the pull first tends to get athletes to focus on using the legs and hips to propel the bar upward as opposed to the arms (when some athletes learn the snatch and clean first, they seem to feel compelled to use the arms. They feel that the arms must pull the bar to the shoulders or to arm’s length overhead, even though this is not what should be done). Of course for athletes who do not have the flexibility in the arms, shoulders, or wrists to catch the bar overhead, or rack the bar on the shoulders, learning to pull first may be the only real option.

There are two main variations of the pull. The first involves pulling the bar from the floor through the power position then finishing with the body fully erect, the legs locked, the lifter shrugging the shoulders, and generally rising at least somewhat on the toes, but keeping the arms straight at the end of the motion. Consequently, the bar’s upward height is limited to a position where the body is fully lengthened with the arms in a fully locked position.

A second approach, probably the more popular one today, is to pull from the floor through the power position as explosively as possible and then let the arms bend as the bar travels upward, so that it goes to whatever height it will as a result of the upward explosion of the pull from the power position. However, the arms are not pulling on the bar to bring it up, rather they are merely bending to permit the bar to travel upward. Some lifters who perform such pulls also bend the knees to lower the body somewhat after the explosion to better simulate the knee re-bending that will take place during the actual lift.

Of course pulls can also be done from the power position, below knee, and others positions between the power position and the floor. Many coaches find such variations useful for addressing specific areas of technical or power deficiencies.

### Back Squat

The squat, or back squat, is considered one of the most result producing exercises in the realm of weight training as it builds great strength in the legs and hips, the muscles with the greatest strength potential in the entire body. Many lifters find it to be a more comfortable way to perform squats than the overhead or front squat versions. However, the back squat is not as “specific” as the front squat or overhead squat in terms of carryover to the snatch and clean, so most lifters do some of their squats with the bar held behind the neck and the rest in the front squat position throughout their careers. In contrast, overhead squats are absolutely essential for beginners but more advanced lifters do not generally perform them very often, if at all because they do a great deal of squat snatching, which gives them ample practice in the low squat position and conditions their wrists, arms, and shoulders to handle heavy weights in the overhead position.

The back squat proceeds in the same way as the front squat, except that the bar is placed on the tops of shoulders behind the neck, and is supported by the trapezius muscles, as well as the shoulders. It is recommended that the shoulders be drawn back and raised somewhat to help support the bar and minimize contact with the vertebrae. The torso is held as upright as possible and the universal posture is maintained as the lifter descends into the low position, in much the same way as for the front squat.

Then the lifter, maintaining the torso in an upright position, returns to a standing position.

Spotters are strongly suggested for heavy squats, especially when near maximum and maximum attempts are being made. As has been explained earlier in this manual, safely missing in a front squat is relatively easy once the proper approach has been learned. Getting rid of the bar after missing a back squat is more difficult and risky, therefore, it is not suggested.
The most common use of spotters is in the back squat, although they can be used with benefit in the front squat as well. They are not generally used during an overhead squat, since the athlete simply drops the bar if the lifter cannot complete the lift, but they are often used to help the lifter return the bar to the rack in the overhead squat exercise once the lifter has completed performing his set.

You should secure a spotter for each side of the barbell whenever the weight being used is expected to be difficult for you. Then, if you cannot complete the squat, which the spotters will judge by watching the bar and stopping its downward progress as soon as they see the bar not only stops on its way up, but also begins to descend the slightest amount (or sooner if they hear the lifter ask for assistance). In this case, the spotters grasp the end of the bar on their respective sides, making sure the other spotter is doing the same, and then together they assist the lifter in getting up, as the lifter exerts as much effort as possible to assure that the spotters are not lifting the bar by themselves.

Spotters are also very important when any exercise ends by returning the bar behind the neck after placing it overhead, such as when jerking behind the neck or performing the snatch balance (exercises that are explained below).

**Snatch Balance**

Most lifters are able to learn the squat snatch by practicing power snatches and overhead squats and then transitioning into full squat snatches as was described earlier. But others can benefit from an exercise called the snatch balance or drop snatch, an exercise that has several variations. All of the variations begin with the lifter taking the barbell from a squat rack with the bar positioned behind the neck in a snatch grip, on the shoulders and trapezius muscles. As was the case for the overhead squat, lifters are to be discouraged from lowering the bar behind the shoulders unassisted, especially with a snatch grip and with a weight that cannot be slowly lowered to the shoulders by resistance from the arms alone.

As with all other exercises already described, it is generally best for beginners to start with a stick, a light bar of 5 to 10 kg. or a regular bar of 15 to 20 kg and gradually increase weight only when, the lighter weight has been mastered.

Athletes must learn to move under a snatch very rapidly which is done by a skilled athlete. Done correctly, the descent under the snatch is one of the fastest motions in all of sport, so speed in moving under a snatch must be learned and snatch balances can be helpful in teaching this.

The easiest version of this exercise begins with the bar being placed on the shoulders behind the neck, as it would be for a back squat, except the hands are placed in a snatch width grip (the bar is usually taken off a squat rack). The lifter bends the legs as he would in the jerk and drives the bar up. At the same time, the lifter jumps down rapidly into a full squat position to catch the bar overhead on locked arms. The goal is to perform the drop into
the squat at the same speed that will be used in the squat snatch itself. But because the bar is being driven up with the legs, instead of being pulled up as it would be in the snatch, the lifter has little horizontal motion to contend with when trying to balance the bar in the receiving position so can focus exclusively on the latter.

In another version of this exercise, the feet begin in the pulling position (generally a narrower position than the one used in the overhead squat) and then after the drive are skipped out to the overhead squat width. The idea is to more fully emulate the transition from pulling to catching that occurs in an actual snatch by jumping the feet out from the pulling position to the overhead squat position after the drive and as the lifter drops down under the bar.

Once a lifter has mastered the versions of the snatch balance discussed above, she is ready to move on the most advanced version of the snatch balance exercise (also known as the Drop Snatch). In this variation, the lifter simply drops explosively into the full squat position with no preliminary drive from the legs. This requires the lifter to move very rapidly under the bar in order to bring it under control successfully. Although this exercise is not practiced widely by advanced lifters, some such lifters have reported being able to perform this exercise with a weight in excess of their best snatch. Of course with beginners, only light to moderate weights are used. Generally, when a lifter can do this well with even a moderate weight, a weight somewhere in the area of what he/she can power snatch, the lifter will have little trouble moving rapidly under a full squat snatch.

**Military Press**

This exercise is performed in much the same way as the press behind the neck, except that the bar begins on the front of the shoulders. The lifter pulls the head back a little and tucks the chin in before the press is begun. Then the athlete pushes the bar up, keeping it close to the face, and once the bar clears the head it is pushed back until it is above or slightly behind the shoulder joint and the arms are fully locked overhead. After a brief pause, the motion is reversed to bring the bar back to the shoulders in front of the neck. As in the press behind the neck, the torso is maintained in a strictly vertical position throughout the lift and the legs are not used to assist the lift.

Many prefer this exercise to the press behind the neck. Some lifters find it more comfortable to perform and lowering to the shoulders in front of the neck is generally easier to do. In any case, practicing pressing of some kind is a good idea, as it gives lifters added strength in the arms and shoulders that will help them to control the bar overhead.

**Press Behind Neck (PBN) – Clean and Snatch Grip**

These exercises develop arm and shoulder strength. They can also help the lifter who never held a weight overhead develop balance and awareness of weights in that position. Some coaches prefer to teach the press from behind the neck (versus regular presses in front of the neck) because the bar path is almost directly up from the shoulders to a position above the shoulders when the bar is locked out at arm’s length overhead.

The exercise begins with the bar on the shoulders behind the neck (as it did in the squat and snatch balance exercises already discussed). The bar is then pushed up straight overhead to full arm’s length, with the bar positioned directly above or slightly to the rear of the shoulder joint. Then, after a brief pause, it is lowered slowly to the shoulders to perform further repetitions and finish the set. The exercise proceeds in the same way whether the lifter is using the clean or snatch grip. In both version of the exercise, the torso remains upright and the legs remain locked throughout the exercise. Some lifters bend the legs slightly as the bar is returned to the shoulders after the press to absorb the downward force of the bar as it is lowered, which is a reasonable approach. But the legs should not be used in conjunction with the upward pressing of the arms to drive the bar overhead. The exercise begins with the chest inflated and a partial or full breath having been taken. The lifter exhales during the press or after it is finished.
Snatch Grip Presses in the Full Squat Position

The athlete assumes a full, low back squat position with the bar held in a snatch grip. Now the lifter performs a press behind the neck while in the squat position. This exercise will improve a lifter's balance in the squat position and the ability to press out on the bar in that position. Typically, only the empty bar or very light weights are used in this exercise.

A variation of this exercise, referred to as the Pressing Snatch Balance, has the lifter begin standing with the bar on the shoulders, behind the neck. The lifter pushes up on the bar with the arms as he/she descends into the full squat position with the arms fully locked.

Press in Split Position

In this exercise the bar is taken from a rack and the lifter moves the legs into the split position used for the jerk. While balancing in that position, the lifter presses the bar up to arms length while remaining in the split. This teaches balance in the split position and only fairly light weights are used in this exercise.

Power Jerk Behind Neck and Jerk Behind Neck

Some athletes who experience difficulty in executing the power jerk and jerk may find it useful to do some practice in the power jerk or jerk behind the neck. The chief advantage of this exercise is to teach the lifter to end the jerk with the bar above or slightly behind the shoulders. Some lifters find it difficult to get the bar into that position when they perform the power jerk or jerk, and these exercises can help to make them comfortable with the bar in the correct finishing position.

These exercises are essentially identical to the standard versions of them except that the bar begins resting behind the neck, on the tops of the shoulders and trapezius muscles. From there the dip and explosion are the same as for the regular power jerk and jerk with the athlete catching the bar overhead, with the elbows fully locked, and the bar over the shoulder joints or just behind the hips and torso under the shoulder joints. The major difference is that the chin is not tucked in and the head pulled back before the drive begins, as the bar does not have to clear the chin but rather the back of the head.

However, caution must be taken on two levels when these exercises are used. First, every finished rep must either be dropped to the platform or lowered to the shoulders with the assistance of spotters, to avoid any jarring contact with the neck or vertebrae of the upper back. Failing to do this can result in injury to the vertebrae. Second, some lifters can become very adept at jerking behind the neck to the point of being able to lift much more from that position than from the front of the neck. This can occur without the lifter improving the jerk from in front of the neck at all. Jerks from behind the neck can be helpful learning tools, but they should not be practiced to the point where they are preferred to the regular versions of the jerk.
VII. Designing Training Programs

What you have learned thus far in this course has essentially been the tools for creating technical weightlifting success. But in order for these tools to work in an optimal fashion, they must be placed in the context of an effective overall training program. It is through such a program of carefully structured sequences of exercises, carried out over the course of many training sessions, training days, training weeks, and training months that the development of an athlete’s ultimate weightlifting capability will occur.

In this section of the manual, we will explain the generic structure of daily, weekly, and monthly training sessions. Then we will look at a more detailed way at the structure of a training session, both in terms of content and the sequencing of the exercises that are included within that training session.

Successful Programming Begins With Clear Objectives

The programming process begins with the establishment of objectives for the training to be carried out. If the athlete’s goal is to rise to the highest levels possible, the focus of the athlete’s early training must be on the development of weightlifting technique, and on correcting any flexibility deficiencies which may hamper the achievement of correct technique. Early programming will also focus on very gradually conditioning the athlete’s body to accept greater training loads, both in terms of weight lifted and in terms of the cumulative amount across a period of weeks or months.

In contrast, if an athlete’s main interest is another sport, such as football or the martial arts, the athlete may simply wish to learn how to perform the Olympic lifts or variations thereof as a means, and a uniquely effective one for improving performance in his/her sport. In this instance the athlete may wish to learn only the power versions of the snatch, the clean, and the jerk. Such athletes do not need to focus on flexibility for the low squat position or on learning the front or overhead squats. Although they should learn to do back squats correctly, so that they can develop their legs to the maximum extent possible in a safe fashion. In addition, athletes who are training for other sports do not need to condition themselves to perform daily weightlifting workouts as their workouts may be limited to twice or three times per week on a permanent basis. Athletes from other sports can develop perhaps 80% of the performance level of high-level weightlifters with 20% of the effort. That is good because they need their energy to focus on their respective sports, instead of becoming outstanding weightlifters. Similarly, athletes do not need to develop perfect technique in the full squat lifts as long as the technique they have in the lifts they are doing is mechanically sound, consistent, and safe.

In this manual, we will provide sample programs for beginning weightlifters and for athletes wishing to use Olympic style lifts that condition them for their respective sports. In the latter case, the coach will need to make sure that practice on the Olympic lifts is carefully integrated with other forms of strength and conditioning and sport specific work that the athlete is doing, in order to develop the athlete maximally for his/her particular sport.

Every weightlifting training program should have the goal of improving strength and power. But the training programs beginning weightlifters follow are designed to start the slow process of developing the body, so that it can withstand the rigors of daily training with sufficient volume to learn technique and build strength and power. Some will require additional training to correct mobility problems, or exercises to strengthen specific areas of the body to condition them to sustain weightlifting stresses.

At the same time, for all beginners (and throughout the careers of competitive weightlifters), the program must include skill building, to help the lifter achieve ever more efficient performances, as well as improved consistency. In addition, for each skill building exercise of each workout, there should be a technical goal (e.g., when performing the jerk, assuring that the drive is strictly vertical). By having a skill improvement goal for each exercise (generally a single goal is best on a given day, or at least the training session), you will assure that the athlete will get the most out of that exercise, not just some general benefit presumably conferred by that exercise.

Warming Up

Most athletes and coaches find a thorough warm-up to be an essential at the very outset of a training session. There is significant evidence that a correct warm-up prepares the body and mind for the challenges of the training to follow, reduces the risk of injury, and improves performance. Increased heart rate, strength of muscle contraction, efficiency of the neuromuscular system, work capacity, muscle elasticity, and range of motion can all be enhanced by a thorough warm-up, and the USAW completely supports this approach. A thorough warm-up should be mandatory before an athlete attempts to lift heavy weights.
It is typically recommended that athletes in all sports perform a general warm-up before proceeding on to a warm-up for their specific sport. A general warm-up involves exercising the major muscle groups of the body with little or no resistance and through a limited range of motion at the outset. The range of motion is then increased gradually as the athlete warms up. Some examples are jogging, jumping jacks, arm, trunk and wrist circles, shoulder stretch/dislocates, and similar light calisthenics. The warm-up should be just rigorous enough to increase the body core temperature somewhat and cause mild perspiration, but not to cause fatigue, especially of the muscles that will be used in the body or main part of the training session.

It should be noted that Weightlifting presents a special case when it comes to warming up in that the competition lifts and related exercises do involve the major muscle groups and of course can be loaded in such a way as to not materially fatigue the muscles. Consequently, many weightlifters, do their warm ups with a stick or empty bar, by emulating parts of the competition lifts and performing various forms of squats, pressing, and lunging.

For instance, an athlete might do power snatches with an empty bar by starting with the bar above the position that it would be in if a weight were taken from the floor. Then, over several sets, the athlete might increase the range of motion by lowering the bar further at the start of the exercise and incorporating gradually lower overhead squats or gradually lower snatches, until nearly full or full competition snatch positions are being achieved. Many such athletes incorporate various mobility exercises during their warm-ups as well, but these exercises are designed to help the athletes realize their current maximal level of flexibility, not to improve on that level. Training to improve on ones current maximum range of motion is conducted at the end of the workout, after all technique, speed and strength exercises have been completed, but while the athlete is still warm.

All stretching exercises are stopped as the lifter begins to add weight to the bar for a gradual progression toward heavy weights, because continued stretching is unnecessary and can compromise performance if the muscles being stretched are the same ones being used to generate or receive force during the execution of the competitive or related lifts, such as the quadriceps muscles (the muscles in the front of the thighs).

Beginners Must Learn Technique Using Light Weights – But Lighter Weights Also Make Them Stronger Faster Than Heavy Ones Would

One factor that we can never emphasize enough is that weightlifting training contains an amazing secret. The secret is that lifting light weights at the outset of training not only facilitates the development of sound technique, but the use of light weights at the outset also maximizes the development of strength and power. Research performed in the USSR decades ago demonstrated that beginners actually improved more quickly when they trained with light weights than when they trained with heavier loads relative to their strength and power level. This is not the case with more advanced lifters, who over time increase intensity and the volume of their training. It is very fortunate indeed that using light weights at the outset optimizes strength, power, and technique, because if it were otherwise, coaches and athletes would be perpetually faced with a difficult dilemma. How would they balance the need to stimulate the development of strength and power with heavy weights against the need to develop technique with lighter weights? Fortunately, no such dilemma exists for the beginner. Sound weightlifting coaching for beginners that optimizes both the development of technique, strength, and power involves the use of light weights, at least in high skill exercises. As the athlete develops, he/she will need heavier weights to stimulate continued increases in strength and power and to further refine technique. But by that time the athlete will be in condition to perform training with these heavier weights and will have sound enough technique that the likelihood of a break-down in technique will be minor.

General Need to Change Training Only Gradually and in an Undulating Fashion

It takes time for an athlete to adjust to any change in training. Therefore, one does not double the load an athlete is handling overnight or even increase it by 25%. For example, if an athlete has been performing three sets in the squat to strengthen the legs, one does not suddenly increase the training load to six sets overnight, instead a fourth set is added. Then if that is well tolerated across a few weeks of workouts, a fifth set might be added (although if progress improved after adding a fourth set, the coach might want to stop there for at least a while). Such a process continues until the desired level of loading is achieved over a series of months and years. Again, it is both unsafe and unnecessary to change a load suddenly. Since an increase in load is appropriate, the athlete will likely benefit most from the first increment in loading and progressively less from each additional one. If a change
in volume occurs precipitously, at least some athletes will suffer in terms of overtraining, over stress injuries, and other unpleasant conditions.

There is another important issue to consider when loading is being increased. Athletes do not generally tolerate a straight line increase in the volume or intensity in their training very well. Instead, they generally benefit most from increases in loading and intensity that are alternated with periods of lower loading or intensity. This undulating pattern of training, training at a higher level, and then reducing training to a level somewhat higher than the lowest level in the past, then increasing it to a new higher level, is extremely effective.

Another advantage of gradual increases in loading is that they help the athlete and coach understand if the first planned increase in loading can be safely tolerated by the athlete. To continue the prior example, if performing six sets of squats at a certain weight was ultimately planned and the athlete shows signs of failing to recover from workouts that have even four such sets, then it may be appropriate to reexamine the original goal.

The coach may decide either not to increase loading to the originally planned level, or simply to reduce training to an earlier level to enable the athlete to recuperate. The training might then be structured to generate more gradual progress toward the desired load, or reflect a more modest loading goal.

Whatever the overall level of training load, and whether or not it is being changed, an undulating pattern of training that alternates higher and lower volume and/or intensity should be used, across training sessions in a day, days in a week, weeks in a month and/or months in a year. This kind of variation, should occur on at least some, if not all, the aforementioned training categories.

**Practice Some of Each Skill But Not Too Much of Any One**

Athletes and coaches often fall into the trap of practicing technique on a certain exercise and becoming so immersed in the process of teaching and learning that exercise that they lose sight of how many lifts they are performed, or how long they have practiced. They also tend to practice what they find most interesting and what they are having success with. So it is not unusual for a new athlete who is being taught how to snatch to come in and spend an hour doing snatch and then be too tired to do much of anything else. Therefore, the training session must be carried out in such a way that ample time is devoted to each item or area that needs to be trained. So if an athlete will train for an hour, perhaps 15 or 20 min. should be devoted to snatching and somewhat shorter time periods to cleaning and jerking, and then some time is spent on strength training such as squatting and pressing. The workout then might end with some mobility exercises.

The point is that while it may be appropriate to spend some additional time on an area that is lagging, it is completely inappropriate to spend so much time in a particular exercise that practice in other needed areas is ignored or is done in a desultory fashion.

**Constantly Reorder Skill Building Exercises – Unless One Exercise Needs More Work**

If an athlete is reasonably well-balanced in terms of technical proficiency, it is generally a good idea to vary the order of technical exercises from workout to workout. For instance, an athlete might begin with snatches during one training session, then switch to cleans during another training session and begin with jerks from the rack in still another training session. In this way the athlete is devoting his/ her first, and generally best, energy to a different technique building exercise during every workout.

The opposite is the case when an athlete is lagging in a particular exercise. For example, if an athlete is relatively poor in the jerk, as compared to the snatch or clean, it may be wise for that athlete to begin nearly every workout with the jerk until it has improved sufficiently for it to be on a par with the clean and the snatch (which will almost inevitably occur with sufficient practice in the lagging area).

In his bestseller, *The Goal*, Eliyahu Goldratt explained his “theory of constraints.” In its briefest essentials, that theory says that in every system (e.g., a lifter’s technique) there is a constraint, a link or segment that limits the output of the system to be increased, only an improvement in the performance of this constraint will enable such an improvement. Improvements in any other area will not result in an improvement in the output of the entire system and may actually cause negative effects. The implication for training weightlifters is that lifters and coaches must relentlessly identify and improve upon the weakest parts in their technique in order to optimize progress, and one of the most powerful ways to do this is to work the weak points first. This of course applies to the ordering of strength development exercises as well.

**The Order of Exercise Categories in a Given Training Session**

The general order of exercises in the training session should be structured as follows:

1) Warm up and achieving the current level of mobility;
2) Technique building exercises;

3) Strength and power building exercises;

4) Flexibility training and cool down, depending on an athlete’s needs.

As was mentioned earlier in this manual, athletes begin with a warm-up that is designed to raise the body temperature and reach levels of mobility that are currently within the athlete’s capabilities. The warm-up period is not aimed at improving mobility beyond its current ranges. For some, a general warm-up will be used, and for others the warm-up will occur simply with exercises that simulate the Olympic lifts, beginning with very light loads and progressing upward.

Technique building exercises generally consist of the Olympic lifts themselves or progression toward those exercises that are designed to build the athlete’s skill base (e.g., the progressions already covered in this manual). Performing these exercises immediately after the warm-up assures that the athlete will be addressing the mentally and physically challenging process of developing technical proficiency when he/she is “fresh.”

It is generally true that technique building exercises will also improve an athlete’s power and strength. However, most athletes require some additional training to develop strength, thus the third category of exercises in the training session. The most common example would be front and back squats, which are used by more advanced athletes to develop leg strength and by beginners to develop strength, coordination, and balance in a low squat position. Clean and snatch pulls might also be performed during this part of the workout to improve the strength and power of the pulling muscles. Pressing exercises are another example of the kinds of exercises that would be carried out during this particular strength development portion of the training session. Such exercises can be particularly useful for athletes who have no experience with lifting weights overhead.

Finally, once the technique and strength building exercises have been completed, the athlete goes on to whatever exercises may be needed, if any, to improve mobility to the point where the athlete is able to perform lifts correctly with no restrictions. It is typical for beginners to spend more time in this phase of the training than more advanced lifters. This is because the advanced lifters have presumably already developed the requisite flexibility to perform the lifts and are training simply to retain the mobility they have. In contrast, the new lifter is trying to develop the level of mobility required in order to perform the lifts in the first place and therefore may require significant mobility training.

**Cooling-Down**

Following, or toward the end of aerobic (cardio) training sessions, a gradual reduction of one’s heart rate is generally advised, after it has been sustained at a high rate for many minutes or even hours. The case for such an approach after a strength training session is not as clear. Many weightlifters do close their training sessions with moderate stretching of areas that have been affected by training, to assure there is no residual tension in those areas, particularly in the lower back. Many believe that mild activity of this kind helps to remove the wastes of muscle metabolism that may have accumulated in the muscles during intense training. So you will see lifters stretching the lower back by flexing the trunk with straight legs, hanging from a bar and performing other mild mobility exercises or light activity. If later exercises in the workout have involved movements through a partial range of motion, some light full range of motion movements are often performed. As was mentioned above, there is a much clearer case for another kind of cool down, or at least end of workout training, that involves strenuous flexibility training. This is absolutely essential for athletes whose pre-training assessments have indicated that they lack the flexibility necessary to perform one or more competition or related lifts correctly.

**A Debriefing Can Be Very Useful**

Finally, the post individual exercise or complete workout process that, sadly, is often ignored, is a brief recapitulation of the workout by the athlete and coach. The emphasis should be on reviewing the good things that happened during the workout and any lessons learned, and on planning for further improvement in the next workout. The exercises for that next workout may very well have already been planned, but it may be appropriate to adjust them on the basis of the athlete’s performance in the workout just completed. However, even if no change in the exercise content of the next workout is contemplated, it is very useful to discuss what should be focused on while the athlete is performing these exercises. For instance, if it has been observed that the athlete’s hips were moving backward when he lowered his/her body into the split position of the jerk, the instruction might be to focus on dropping the hips straight down while jerking in the next workout, and to have the coach or other athletes provide feedback from the earliest sets of that exercise with regard to the lifter’s hip movement. Whether the review is done at the end of practice on a specific exercise, or at the end of a training session, it should be done. The key is to extract from the results of the workout some useful learning that can be applied in future training sessions.
Progressive Overload the Difference Between Exercising and Training

The body that is stressed in the same way all of the time will simply remain as it is. An exception to this occurs when the existing level was already too much for the body to handle, in such cases a reduction in performance will occur if that level of stress is maintained. But more generally, there will be no training effect and no change in performance if the level of training stimulus remains the same.

In contrast, when the body is presented with a higher than customary level of stimulus or stress it will generally adapt, by getting stronger and more powerful. This is generally done by increasing the amount of weight being lifted (intensity), and/or the number of times it is lifted in a given time period (volume). Both volume and intensity can be increased together, but in such a case one has to be very careful not to overstress the body. Increasing only one of these factors helps to assure that such overstress will not occur. But failing to increase either variable virtually assures that no progress will be made.

The Simplicity Of Strength and Power Training

There are many methods of weightlifting training, and coaches are known to argue at considerable length, about the relative merits of various approaches to training. But one of the factors that is not debatable is that training is intended to increase one’s strength and power, and if that is not happening, there are generally two possible causes: you are overtraining or you are undertraining. Overtraining means that the overall volume of your training and/or its intensity of the training is too great for the athlete’s body to recuperate from it. Undertraining means that your training is insufficient to stimulate improvement. Consequently, when not improving, you simply need to increase your training stimulus if you have been undertraining, or reduce it if you have been overtraining. If this is done effectively, progress will almost invariably occur. This is something of an oversimplification in that too little sleep or other forms of training, such as you are running for a marathon, can all cause a halt in progress. But if those factors are not the cause, overtraining or undertraining are usually the culprits.

The further good news is that if you are unsure what the problem is, there are only two alternatives to explore. Reduce the training load/intensity, or increase it, and observe what happens. If you reduce training and progress still declines, the athlete was likely undertraining. In contrast, if there is progress by reducing training, the athlete was probably overtraining. Conversely, if you increase your training and progress is once again enjoyed, the athlete was likely undertraining.

Repetitions and Sets

Virtually all weightlifting training is described in terms of weight lifted, and the “repetitions” and “sets” it was lifted. In weightlifting, each time a weight is lifted, it is referred to as a “rep” which is short for repetitions. If a lifter lifts a weight, then lifts it again with little rest, he has done two reps. As soon as a lifter stops lifting for more than several seconds, he is considered to have completed a “set” of repetitions. If a lifter lifts a weight three times in succession and stops for a minute, he is said to have done one set of three reps. If he then lifts the weight for two repetitions and stops, he has completed another set, this time a set with two repetitions.

For skill building exercises done with a stick, empty bar or other light weight, beginners typically perform five or so repetitions per set. If the athlete is really focusing on doing each rep separately and correctly, five repetitions requires between 10 and 50 seconds. This is long enough for an athlete to have to focus in one continuous effort. When heavier weights are being used, but the weights are still below maximum, a similar repetition scheme can be followed. The exception to this is a compound exercise such as the clean and jerk. Because both the clean and jerk constitute strenuous exercises, performing five repetitions in the clean with moderate weights is acceptable, but performing 10 repetitions in the clean is generally too much, and so is performing five cleans and five jerks in the same set. The athlete is better served by counting cleans and jerks separately toward the five rep guideline, so that if a set of five reps is called for, the athlete does perhaps one clean and four jerks, or one clean and jerk followed by four cleans, or two repetitions of the clean followed by three jerks. Similarly, when the athlete is combining pulls with snatchs, he/she might do two pulls followed by three snatchs, for a total of five lifts per set.

More advanced athletes who are lifting heavier weights which are closer to their maximums rarely do more than three repetitions and most do sets of two, or simply one repetition (aka a “single”). The latter is the most common. This is because as the weights grow heavier, fatigue is created by each repetition and such fatigue may impair the performance of the subsequent rep for the athlete who is not fully recovered from the effort of the first rep. This can lead to a breakdown in technique, or over fatigue in one area of the body, so performing reps in excess of two in the squat snatch, the squat clean, and the jerk is generally not advised, unless the weight lifted is well below maximum.
In contrast, in pure strength building exercises, such as pressing and squatting, it is not at all uncommon for athletes to perform 5 to 5 repetitions instead of singles or doubles. Although many athletes stick to the lower rep ranges in these exercises as well.

Some coaches use five or even more repetitions during the preparatory stage, which is a stage explained later on in this text, for unloaded skill drills such as footwork in the jerk and when training strength movements like squats and presses. If five reps were performed during a certain part of the preparatory phase of training, three reps can be used as the athlete transitions toward lower reps in the competition phase. Three reps are often used throughout the training cycle for strength movements as well. One to two reps are used most frequently in the pre-competition training phase, the latter being more popular, and used by some athletes and coaches almost exclusively because only one rep is done in competition.

There tends to be an inverse relationship between sets and repetitions. That is to say that when repetitions are at the higher end of the scale fewer sets are generally performed. Alternatively, when the reps are lower, more sets are done. So if an athlete is performing squats with the top weight of the day, he/she might do three sets of five repetitions or five sets of three repetitions in both cases performing a total of 15 repetitions. Or the athlete might perform eight sets of two repetitions to reach a similar total. When doing singles, most athletes stop somewhere between 3 to 7 singles with their top weights of the session, depending on the intensity of the weight being lifted. Athletes who train primarily using singles tend to train more days or sessions per week.

In general, workouts with weights that are at least somewhat strenuous with respect to weight lifted (not pure technique training lifts with sticks and very light weights) start out being performed for one set in the first week or two of training. Then the lifter progresses to two sets for a week or two. Then three sets are performed for at least a few weeks. Most lifters can make reasonable strength gains using three sets in strength exercises for quite a while. Ultimately, five sets or more may be performed, depending on the intensity and number of reps per set. But it is rare for lifters doing more than single reps to do more than 5-5 sets, except for skill exercises, or the first exercise done in the day which will tend to have more sets because the lifter uses such exercises as a means of warming up gradually, by starting with an empty bar and slowly working toward the heaviest sets planned for that workout session. Exercises done later in the workout, especially if they do not require a great deal of skill and follow a related exercise, may require fewer warm-up sets. For instance, if a squat is being performed after cleans, only a few warm-up sets may be needed because the legs have already been warmed up in the full squat position.

**Exercises, Volume, and Intensity – The Three Critical Workout Descriptions**

The contents of training are generally described in three ways: the exercise performed, actual weights lifted and the number of repetitions that were performed. The exercise will be listed first, followed by some indicator of at least the highest weights to be lifted, and then the number of sets and repetitions that are to be performed. The amount of weight lifted is sometimes presented in actual kilos or pounds. However, when some coaches describe a workout they list target weights and others list the amount to be lifted in relative terms, generally either as a percentage of that lifter’s maximum capability at the time. For instance, “90%” for a lifter whose best snatch is 100 kg. would mean 90 kg. If a plan uses a word such as “max”, it suggests that the athlete is to lift as much as possible, hopefully a personal best.

In terms of describing and analyzing training, the three previously mentioned quantities are what are normally considered in both the aggregate, and at a more granular level. The coach is interested in what happened in a given exercise or in a given training session, to see how the lifter reacted to that training, both during the training session and over the long term. So the coach will be interested in seeing how an athlete performing maximum lifts in the clean performed them during the workout. Did he miss 100 kg twice before making it for three consecutive lifts, each lift done as a single? Or did he make 100 kg for three consecutive lifts before missing? The former pattern might indicate that the lifter did not warm-up adequately for trying his maximum lift on that day, or it could simply be a random occurrence or a mental lapse. Similarly, if the lifter made the first three lifts with a given weight, then missed the last two, it might indicate that the athlete was fatiguing toward the end of the practice, or that it too was a random occurrence or because of a technical mistake unrelated to fatigue. The coach will need to assess that with the assistance of the athlete and adjust accordingly.

In broader terms, the coach will examine the number of repetitions performed in a week or month as a gauge of the overall volume of training performed by the athlete. The coach will also look at the intensity of lifts performed, generally as a percentage of the lifter’s maximum in that lift. So the coach might total of the number of lifts with 90% weights that were done in a given month and the
number of lifts done with 100% weights, as well as the number of lifts done with 80%. In addition to considering the total number of lifts in each exercise, the coach will look at all lifts combined and evaluate the total trading volume for the lifter had during the weaker month and perhaps a longer period. If the average intensity of the lifts performed was similar to prior months, but the volume increased by 10%, and the lifter was showing signs of fatigue after a month from that kind of training, the coach might wish to adjust the volume downward to its prior level but then try increasing the intensity of certain workouts instead, thereby raising the average intensity of the workouts across that training period. Or they might increase the volume by 5%.

Communicating and Measuring the Content of a Training Session

A coach constructing a training program generally prescribes the higher weights to be lifted in a given exercise on a given day on the assumption that the warm-up to those weights will be relatively similar.

The Importance of Recording the Plan and the Results

While long term multi-month or even multi-year training plans can be and are constructed, the process of training an athlete effectively consists of testing multiple hypotheses (elements of the training plan), then observing and analyzing the results. If the results are completed in accordance with the plan, training in accordance with the plan can simply continue. If results were better than expected, that is even more reason to continue with the plan. But when negative deviations from plan are observed over time, some analysis is appropriate. If the planned for weights and exercises were not completed, what is the reason? Did the lifter simply not complete the workouts as planned because the workouts were missed or shortened for some reason? Did the lifter try all of the planned exercises and weights, but fail to lift them? If workouts were missed, the coach might want to simply have the athlete complete the training program originally planned. In contrast, if the athlete trained as planned but simply could not lift weights that were planned, a reevaluation of the plan is in order. Perhaps the plan was too ambitious for the athlete at that point in time. In such a case, a reduction in the overall load and intensity may be appropriate. Alternatively, the failures may be because of faulty technique. If that is the case, the coach must consider what must be done to improve the athlete’s technique in the deficient areas, and special drills or mental focus may be added to the workout to correct the perceived deficiencies.

None of this can occur effectively unless the athlete is keeping careful records of the training session. This should be done in a diary which lists each workout, the date and time and the exercises performed with the weights actually lifted. There are a number of systems for recording workouts, but perhaps the most efficient is to record the amount of weight lifted and listed for each set first. If only one repetition was performed, simply writing the number for the amount lifted is sufficient. A comma can be used to separate sets in the training diary. If an athlete performs more than one repetition, then the times symbol (X) can be placed next to the weight and the number of repetitions is recorded next to the times symbol. Finally, if the same weight is lifted for the same number of repetitions in more than one set, a second times symbol can be added, followed by the number of sets performed. In this case, the number of repetitions performed per set is placed first, even if only one repetition was performed. In this way, the athlete never writes more than what is necessary to record the set. If a weight was attempted but not made, a line can be drawn through the weight. If it was attempted and missed several times, a corresponding number of lines can be drawn through the number, each representing a missed attempt. If different numbers of reps are performed with the same weight, each set can be separated from the others by a comma. An example of notation for the athlete who squatted 100 kg. for three sets of three reps, then 110 kg. for a single, a double (2 reps) and another singles would be: 100x3x3, 110x1, 2, 1.

Training Programs For Beginners and Intermediate Lifters

The training programs used by beginners, intermediate, and advanced athletes are quite different. The beginner focuses almost exclusively on learning fundamental technical skills, building a base level of fitness, and improving flexibility as needed. Intermediate athletes focus on developing more refined skills, individualizing their technique, improving weak points, and increasing strength and power. Advanced athletes, assuming they have done the hard work of developing sound technical skills, devote their time to reinforcing the skills already learned and making their execution more consistent, to perhaps making some minor refinements in technique centered around improving efficiency. Another major focus for such athletes is building strength and power. The training of advanced athletes is beyond the scope of this manual, so we will focus primarily on the training programs of beginners, with some attention given to the training of intermediate level athletes.
A Special Caution Regarding New Lifters Who Are Already Strong

From time to time you will train lifters who are strong before they take up the sport. This might be because they have trained with weights for another sport like football or powerlifting. It is particularly important to insist that such athletes learn how to lift correctly before “testing” their strength with heavy weights. That is because such athletes may be capable of lifting heavy weights before they condition their bodies to withstand the specific stresses of Olympic style Weightlifting, such as receiving a heavy weight in a deep squat position, and before they have the technical skill to lift such weights in the correct “groove.” When a person of average strength or a young beginner starts to train, he/she cannot lift a heavy weight, so if a mistake is made, it is made with a weight that is relatively light and the risk of an injury is very small. When a strong person who is unskilled tries to lift a maximum weight, that weight may be heavy enough to result in an injury.

Therefore, beginners who are strong must proceed gradually as their skills develop rather than rushing to prove their “potential” by lifting weights they have not been properly trained to lift. In the meantime, they can certainly train and improve their existing strength levels after skill practice has been completed. However, this is only a good idea if the exercises being performed do not have movement patterns that are opposite to those used in Olympic style Weightlifting training. For instance, low bar squats with the torso leaning over, or Sumo deadlifts, where there is an immediate effort to straighten the back off the floor would not be conducive to the development of weightlifting technique because they reinforce movement patterns that are an anathema to good weightlifting technique.

Lifters who are accustomed to such techniques can keep up their training on those exercises while they slowly learn new movement patterns and condition their bodies to lifting in the correct styles, eventually phasing out their prior lifting styles.

Example of a Weightlifter’s First Week of Training

Because of differences in the experience, existing skills, conditioning, health, and mobility, no two lifters will begin to train in the same way. However, clear guidance can be provided regarding the process that should take place at the outset of training. The mock workout described below provides a model for the coach working with a beginning lifter who is young and reasonably fit. In the example given, the snatch is being taught first. If the clean were being taught first, the word “clean” would be substituted for the word “snatch” in the three days of workouts outlined below.

First Workout – Monday

1) Warm up followed by flexibility assessment and history taking to determine readiness to commence training, assuming training can begin, then go to step 2;

2) Snatch pull from power position; if pull is being done correctly, progress to power snatches from the power position; if not, the snatch pull from the power position is continued for 5 to 5 sets;

3) Footwork for jerk with hands on hips and some preliminary upward leg drive before splitting, using chalk guides for foot positioning; do 3 to 5 sets of 5 reps with each leg forward (which leg will be placed forward permanently in the jerk will be decided after a few workouts during which the athlete gives each foot a trial);

4) Overhead squat with stick, combined with learning how to miss a snatch for 5 sets of 5 reps;

5) Front squat combined with learning how to miss a clean for 2 sets of 5 reps;

6) (Optionally, for athletes who have been doing some lifting from the floor prior to commencing their weightlifting training — not appropriate for completely new to lifting a barbell from the floor). Snatch grip lift-off from floor to mid-knee position for 2 sets (if the snatch starting position flexibility test was passed, if not use the clean grip — if the athlete could not get in proper position even with the clean grip, more stretching needs to be done before this exercise can be commenced);

7) Military press for one set of 5 reps;

8) Flexibility exercises for any areas identified as deficient during assessment and one set of some abdominal exercise if the athlete has not been doing them.

Second Day – Wednesday

Assess the athlete’s reaction to the first workout. If the athlete reports considerable soreness, reduced the work performed in this workout relative to what was done during the first workout. If there was no significant soreness, proceed as described below.

1) Warm up and perform any flexibility exercises identified as necessary during assessment (this is an exception to the general rule of performing stretching exercises to increase range of motion only at the end of a workout, because the new lifter is lifting very light loads and developing flexibility may be crucial in order for the lifter to be able to practice technique correctly);
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2) Snatch Pull from Power Position for one set, followed by sets of Power Snatches from the same position, for a total of 5 sets of 5 reps with a stick or bar;

3) Power Jerk for 3 sets of 5 reps;

4) Overhead squat for 5 sets of 5 reps;

5) Footwork for Jerk, also teach correct recovery from split position for 5 to 5 sets of 5 reps with each leg forward;

6) Front squat for 2 sets with some miss practicing;

7) Optional with same provisos as for item 6 of day one - Snatch lift-off to knee if flexibility is sufficient; if not, continue clean lift-offs;

8) Any needed stretches with cool down.

**Third Day – Friday**

Again assess reaction to the prior workout and adjust if necessary. If the athlete had no significant soreness and performed the exercises planned in the second workout successfully, proceed to the workout presented below.

1) Warm up and any flexibility exercises identified as necessary during assessment;

2) Snatch pull from power position for 2 reps, then power snatches from the power position for 5 reps in the same set. If power snatches are going well, do a second set of 5 reps in the power snatch from the power position. On the third set have the athlete place the bar in the power position but then continue to lower the bar to the knee and then raise the bar back to the power position (the rocking motion that was described earlier in the section that discussed the performance of the power snatch from mid-knee). If the athlete performs that exercise successfully, on the fourth set, begin with 2 reps in the power snatch from the power position and then try two rocking motions followed by a power snatch or two from the mid-knee position. If that is done reasonably well, have the athletes perform 2 similar sets, for a total of 5 sets of power snatches;

3) Footwork for jerk, add some with no preliminary drive, if hands on hips version has been working well; do 5 sets of 5 reps with each leg forward;

4) Overhead squat for 5 sets of 5 reps with some miss practicing;

5) Front squat for 2 sets of 5 reps;

6) Power Jerk for 2 sets of 5 reps;

7) Snatch lift-off to knee for 2 sets (if flexibility is sufficient and there was prior experience with lifting off the floor);

8) Military Press for 2 sets;

9) Needed stretches, jumping, and abs.

A stick, PVC pipe or light bar is used during the first week for working the skill focused exercises such as the progressions and overhead squats. In the footwork, the hands are on the hips, so no weight is used. The weight used in the lift-offs will depend on the preconditioning of the athletes. An athlete, who has been lifting weights from the floor such as when performing deadlifts or even incorrect power cleans with 60 kg., or more, should be able to start with perhaps half of what they have been deadlifting, as long as correct positions and movement are maintained. If the athlete has to exert any real effort to complete the lift-off, it is too heavy. For those with no experience with weights, the stick or a very light bar may be enough, but it must be placed at the correct height for the starting position by using blocks or the like to position the bar at the same height it would reach if it were supported by the large diameter (45 cm) plates.

In an exercise like a squat or front squat, a stick or bar is often sufficient for the first week, especially if that person has never done squats. But for the athlete who has been doing correct squats, he/she can simply continue as he/she has been. The exception is the athlete who has been squatting only to a parallel position, or has been performing a powerlifting style squat, with the bar low on the back and the torso leaning forward. In such a case, the athlete can continue with the present method of squatting at the very beginning of training, while practicing a full and upright squat with a stick or bar. Then, as weight is added in the new squat style, the amount of training on the old style is gradually reduced, so that after several weeks, or several months if need be, the new style completely replaces the old.

It should be noted that the structure of the first week’s workout was created in a purposeful way. There are three workouts which is generally the right amount for beginners. The workouts are spaced evenly across the week. This is also appropriate as better results are achieved by spacing workouts evenly across a week than by performing three workouts three days in a row and then resting for four days. It is unnecessary and generally counterproductive to train more than three times a week at the outset. The body needs time to adjust to training. A three day per week program generally provides appropriate training and rest. Training fewer than three times a week will tend
to compromise progress in training, as learning a skill effectively requires regular practice. Some progress can be made training twice a week, but virtually no skill building will occur if the lifter practices only once per week. Those who can’t train at least twice per week, especially on their skills, are not really training. They are simply exercising and will gain little benefit other than that of simply exercising (i.e., they are unlikely to get much stronger and certainly won’t learn correct technique beyond a very rudimentary level).

If a lifter misses a week of training, it will take approximately one week of training to get back to the level of performance prior to the one week break. In fact, the general rule of thumb for those who stop training is that for every week off you need a week to get back into shape. So if a lifter stops lifting for six weeks, he/she can expect to start training all over and take six weeks of gradual progression to return to the prior level of skill and conditioning, starting with light weights and fewer sets, progressing gradually up to the prior training level.

Modifying the Model Workout for Week One

A number of adjustments to the above model workout are frequently called for because of individual differences among beginners. As was noted earlier, week one could just as easily have been begun with power cleans instead of power snatches, if the athlete showed sufficient flexibility to rack the bar correctly in the clean during the assessments. Similarly, the lift-offs are adjusted or eliminated if the athlete does not have the requisite flexibility. It is never appropriate to have the athlete simply perform lift-offs without the requisite poster (e.g., deadlifts with a rounded back invite injury and will have virtually no carryover to strengthening the body for correctly performed deadlifts).

In the same way, back squats would be substituted for front squats for the athlete who can’t rack the bar properly, but only until adequate flexibility in the wrists, elbows, and shoulders has been acquired. And athletes who demonstrated insufficient flexibility in the legs to squat correctly should use a board for all variations of squatting, until adequate flexibility is attained.

Week Two and Beyond

Begin by assessing the results of week one. If the lifter has grasped the power snatch from the power position, it would be appropriate to begin to do more and more practice from mid-knee. In later weeks, for the athlete who has been performing snatch grip lift-offs successfully, you may want to have the athlete begin with his/her power snatch-es with one or two reps from the power position, then move on to a rep of two from mid-knee and then see if the lifter can do a couple of power snatches from the floor, or at least mid-shin. If that seems to work well, the lifter may begin a gradual process of doing more power snatches from the floor and fewer from the power position and knee until, after a few weeks, most are done from the floor (although it is a good idea to continue to do a least a few of the earlier progressions from time to time to remind the athlete of the technique elements those steps in the progression were designed to direct the athlete’s attention to.

If the lifter seems to regress at some point, some lifts from the power position and/or knees are always in order to remind the lifter of correct movements. In contrast, if the lifter is still having some difficulty performing the power snatch from mid-knee correctly, reinforce the power snatch from the power position and perhaps try some from the L5 position. If that works, you may be able to have the lifter try the lift from mid-knee again.

For the lifter who has started his/her training with power snatches instead of power cleans, two or three sets of power cleans from the power position can be added in week two, and they can begin to progress to the floor over a series of workouts as indicated by the lifter’s performance in each progression.

Once the lifter is performing the power snatch consistently and correctly, and has become comfortable with the overhead squat, the transition from the power snatch to the squat snatch can gradually be made. This transition to at least a crude squat snatch generally only takes a couple of workouts or weeks, if the athlete has been doing consistently good power snatches and overhead squats. After a reasonable squat snatch is being performed consistently, the power snatch practice can be abandoned, or at least greatly reduced, in favor of a squat snatch practice. For the lifter, who has trouble moving into the squat position quickly, the snatch balance and its variations can be very useful while the athlete continues to transition to the squat snatch, until better positioning, speed, and coordination in the squat snatch is achieved.

A similar process should take place in the clean, but learning the front squat comfortably, correctly, and consistently generally happens more quickly than does such learning in the overhead squat. So even if the athlete began by learning the power snatch and overhead squat, and only added power cleans after a week or two, the transition to the squat clean may well happen sooner than the transition to the squat snatch.

In the jerk, the lifter should be progressing the footwork practice from the jump into the split with hands on hips, to dropping into the split with hands on hips. When that is
mastered (usually in 2-3 weeks) then to dropping into the split with a stick or bar held overhead is practiced. In the meantime, some practice on power jerking can be helpful. Once the lifter is performing a drop into the split with a stick overhead and the power jerk correctly, a quick transition into the complete jerk can take place. This typically occurs in one workout, if the lifter has truly mastered the footwork exercise with the stick held overhead. However, the athlete should continue with footwork practice as a warm up for the jerk for some time, so that the correct footwork is reinforced, even as jerking takes place. Once the jerk is being done reasonably well, power jerking should be abandoned or at least gradually diminished in favor of split jerks.

Generally, the lifter should focus separately on the clean and the jerk during the early learning stages. Once each of these lifts have been well learned separately, it is a simple matter to combine the clean and the jerk, and this can generally be done in a single workout if the jerking and cleaning skills are reasonably stable. Separate cleaning and jerking should slowly be phased out in favor of performing the clean and jerk over a period of months, although these exercises should continue to be practiced separately at least once a week. However, if one or other of these lifts lags behind, it may well be appropriate to continue to perform the clean and jerk separately, at least in every other workout, and begin each workout with the weaker of the two lifts until the lift that is lagging begins to catch up to the leading one.

Often the new lifter will become proficient at one lift faster than another. One lifter might seem to “get” the technique in the snatch, but the jerk is a challenge. Such an athlete may then try to devote more time to the snatch because he/she is enjoying it more. Then the other neglected lifts begin to worsen or at least progress in them slows. Remember that it is always important to work harder on the weak link, although practice in all the exercises is essential.

Considering all of the above factors, it is important for the coach to review the progress of beginners at least weekly and then to modify the program appropriately with the general objectives over the long term being a mastery of basic technique and a gradual conditioning to be able to tolerate more practice and improve overall strength and power, along with skill.

**Example of a Weightlifter’s Fourth Week of Training**

By now the training has become a little more well-rounded because the snatch and the clean exercises are both being performed in each workout and split jerk practice has commenced, assuming the progressions have gone well. It is likely by this time that most of any flexibility problems have been at least partially addressed. Naturally, if that is not the case, the program presented below would not be appropriate.

**Monday**

1) Warm up and progressive movements toward the athlete’s current level of flexibility;

2) Power snatch from the power position for 2 reps followed by 3 reps from mid-knee. The next set might consist of power snatch from the mid-knee position for two reps followed by 5 reps from the floor. The next 5 sets would have one rep from mid-knee followed by 4 reps from the floor, for a total of 5 sets. The lifter has progressed to using at least a light bar;

3) Footwork for the jerk with the stick overhead and the right leg forward (the lifter and coach have determined by now that a split with the right foot forward feels and looks more secure) is performed for 5 reps. This is followed by a set in which there are 2 reps in the footwork with the stick overhead, followed by 3 reps in the jerk (the athlete’s first attempts at a split jerk). If that set goes well, the next one follows the same pattern of 2 reps in the footwork and 3 in the jerk and the fifth set has only one rep in the footwork followed by 4 reps in the jerk. If this goes well that athlete can begin to use a bar for the jerk in the next workout;

4) Squat clean is being performed in the same way as the power snatch in step 2 above (e.g., first reps from the power position, then working down to mid-knee and ultimately to the floor). It is assumed that the lifter has learned the front squat and power clean from the floor well enough that in the prior week the transition to the full squat clean was accomplished and now a little weight has been added to the bar (something that is very easy for the lifter to manage);

5) Overhead squat for 4 sets of 5 reps;

6) Front squat for 5 sets of 5 reps;

7) Military press for two sets of 5 reps;

8) Flexibility exercises for any areas identified as deficient during assessment and one set of some abdominal exercise.
**Wednesday**

1) Warm up similar to Monday;
2) Clean using the same approach that was used on Monday for a total of 5 sets of 5 reps with a bar or light weight;
3) Footwork to warm up, then jerks for 5 sets of 5 reps;
4) Power snatch followed by immediate overhead squat and progressing to the transition to the full squat snatch for a total of 5 sets of 5 reps;
5) Overhead squat for 5 sets of 5 reps;
6) Front squat for 5 sets of 5 reps;
7) Any needed stretches with cool down.

**Friday**

1) Warm up and progressive movements toward the athlete’s current level of flexibility;
2) Power snatch from the floor transitioning to the full squat snatch across the workout, for a total of 5 sets of 5 reps with a bar;
3) Jerk with a bar for 5 sets of 5 reps, after a set or two of footwork warmups;
4) Squat clean for 5 sets of 5 reps;
5) Overhead squat for 4 sets of 5 reps;
6) Front squat for 5 sets of 5 reps;
7) Military press for 2 sets of 5 reps;
8) Flexibility exercises for any areas identified as deficient during assessment and one set of some abdominal exercise.

**Weights Lifted During Early Training**

At the outset, all exercises should be performed, especially by athletes with no background in lifting, with a broomstick, 1” PVC pipe, or similar item. It will become apparent with certain lifters, usually those with some background with weights, who have a good level of natural strength that a stick is so light the lifter has some trouble controlling it. In such cases, you may want to use a light or even regular bar to begin.

However, whatever the starting point, a stick or a bar, the lifter needs to have a weight that is so light that he/she need not worry about of lifting the weight at all, but rather just going through the correct motion with no fear of a miss. It must be remembered that overhead lifting, full squatting and splitting are not common in everyday life. Therefore, even with no weight, people find lifting even the body and a stick is a bit of a challenge. So the ideal beginner’s weight is not hard but invites full focus.

If movements are beginning to show some consistency and the athlete is experiencing no discomfort, weight can very gradually be added. But the coach must be ever vigilant to assure that the weight the athlete is lifting is not causing technical mistakes or significant misses. New lifters will often lose their balance even with a stick, because the positions they are hitting are unfamiliar, but if the lifter is using a certain weight (even if it is light) and missing seems to be caused by the athlete’s putting real effort into the lifting the weight, the weight must be reduced until good movement patterns are once again restored.

This approach needs to be followed even with intermediate lifters. If technique was looking good up to a certain weight, then an increase resulted in a technique breakdown, the weight should be reduced until good technique is restored once again. However, if the breakdown seems to be related to fatigue instead of overloading (i.e., the athlete is not able to replicate the good pattern that was achieved on earlier sets even when the weight has been reduced), then the exercise should be discontinued and the athlete should move on to the next stage in the workout. In movements that involve limited skill, such as the squat, the resistance used for higher sets should be high enough for the last repetition in the set to be challenging but not in jeopardy of being missed. Only after the athlete has been training for several months is it appropriate to begin to test an athlete to ascertain the area of his/her true maximum, or something approaching it.

When technique does break down, it is often because the weight was simply increased too much at one time. For instance, let us assume that a lifter has been lifting 50 kg. correctly for several sets and then increases the weight by 10 kg. to 60 kg. At this point technique collapses. It must be remembered that while the lifter added “only” 10 kg., that increase was a full 20% over what the athlete handled the set before. This is the equivalent of a lifter who is using 150 kg. jumping by 30 kg. to 180 kg. Very few lifters indeed would attempt such an increase, and even fewer would be successful with it. So percentages of increase must be considered, not just kilos, for beginners and intermediate lifters, something in the range of a 2-3% increase is more than enough.
There will be a stage where further technical progress can only be made when the lifter practices with relatively heavier weights. For instance, the split second timing required to bring a truly maximum weight under control can only be learned by practicing with weights that require such timing. But that is not the case for beginning or intermediate lifters, who should be focused far more on correct movements overall than split second timing, although reasonable timing should always be strived for.

For exercises where strength building is the primary focus, such as squats and front squats, once the movement has been learned, weights are gradually increased from week to week until, after a period of several weeks to months, the lifter can choose a day when he/she feels strong and attempts a maximum set of 5 to 5 repetitions to see what can be done when the athlete is pushing hard.

Once the full lifts are being performed in the snatch, the clean, and the jerk, and reasonably correct technique has been stabilized, a similar process of maximum finding can be attempted in those lifts. This typically takes several months, which is longer than it takes to reaching a testing day in exercises like the squat or press.

**Within Week Variations in Loading**

The term “loading” refers to the quality and quantity of lifts an athlete performs in his/her training in a given period of time, in individual exercises and/or overall. A common measure of the quality of the loading is “intensity”, which is typically measured by the amount of weight lifted (absolute intensity) or by the amount lifted in relation to the athlete’s maximum for that or similar lifts, usually expressed as a percentage (relative intensity). So an athlete whose best snatch is 100 kg. and who is lifting 90kg. for two reps in the snatch would have an absolute intensity of 90 kg, but a relative intensity of 90%.

A common measure of quantity is volume, which refers to the number of times an athlete lifts something in a given period. It is typically measured in terms of total weight lifted, or in the number of reps done, overall, or at a given percentage of the athlete’s maximum. So the athlete in our example had a total volume of two reps and 180 kg, and 2 reps with 90% of his/her maximum snatch.

Beginners tend to practice with similar weights from workout to workout. The amount of weight lifted will gradually increase over a series of workouts. However, beginners will eventually reach a point where weights they lift will take some real effort, and it is at this point that variations in the amount lifted should be planned across a week.

An old standby approach to the varying the load is called the light, medium, and heavy system. It consists of one light workout per week, one medium workout, and one heavy workout. The light workout might utilize weights of a 70 to 80% rate of the athlete’s maximum. The medium workout might be in the 80 to 90% range, and a heavy workout might be in the 90 to 100% range. If the lifter is training Monday, Wednesday, and Friday, the medium workout might be on Monday the light workout on Wednesday and the heavy workout on Friday. It is generally accepted that, at least for beginner and intermediate lifters, light, medium, and heavy periodization is quite effective. This kind of program can work very well for months and even years.

**Week to Week Variations in Training**

Once a lifter has been training for at least several months, perhaps longer, and has mastered the basic technique of the competition lifts and related exercises, the coach may introduce the lifter to the concept of programs which loading varies across weeks, instead, or in addition to, of variation in the days within a week. For instance, an athlete may train heavy in several workouts per week for two or three weeks in succession, then have a lighter week which allows for recuperation. More specifically, the athlete might perform heavy snatches and cleans twice per week for two weeks in a row, then have a week when no more than 85% is lifted in these exercises and some workouts use significantly lower percentage lifts than that.

Some coaches plan these lighter weeks in advance, and others simply wait for the lifter to show signs of fatigue and then encourage the lifter to take a light week. The important thing is that there is some variation of intensity and volume across weeks.

Volume and intensity can be varied together or separately, such as when some weeks are higher in volume and intensity and others are lower on both measures.
Some Examples of Modified Programs for Sports Conditioning

Athletes who are training for other sports do not need to learn the squat version of the lifts or the split jerk, since much of the benefit from performing the Olympic style lifts arises from the power versions of these lifts. In addition, high levels of skill are not critical. An athlete wants to use technique that is efficient and safe, to maximize performance and minimize risk of injury. But true mastery is not required. Therefore, athletes do not need to practice as often or as long as weightlifters, who are of course only doing one sport - Weightlifting. Therefore, non-weightlifters will find that training two to three times per week will be enough to enjoy excellent results, and that any results achieved can be reasonably retained with training only once per week. So in a sport like football, at least in season, an athlete might do a weight workout every Tuesday, assuming there is a Saturday game and pretty much retain his strength throughout the season. The Tuesday placement of the workout, while not a firm rule, gives the athlete a few days to recuperate from the stresses of the game and even more days between the workout and the next game so that the athlete will be fully recovered before game day.

**Monday**

Power Snatch;
Squat;
Sport Specific Strength Work i.e., exercises that replicate the motion(s) used in the sport or are tested by authorities in the sport such as the bench press in a football “combine”;
Remedial Exercises which are exercises to protect or recondition areas that have been injured or are subject to injury.

**Wednesday**

Power Jerk;
Press;
Sport Specific Strength Work;
Remedial Exercises.

**Friday**

Power Clean;
Squat;
Sport Specific Strength Work;
Remedial Exercises.

Such workouts are brief and to the point in developing power and strength of the all important legs and hips, as well as addressing the tests or stresses specific to the sport. Athletes who have trouble racking the bar or holding even a power snatch overhead can substitute pulls for power snatches and power cleans. However, if this is done, it is strongly recommended that a height gauge, whether a place on the lifter’s body or a stationary one, be used to measure progress and give the athlete a performance goal for each set.

Athletes who have trouble taking the barbell from the platform correctly because of flexibility issues can substitute power cleans and power snatches from blocks that start the bar at a level that is comfortable for the athlete. However, if the athlete will be tested from the floor, it is wise to work on flexibility until the bar can be comfortably taken from the floor and then to substitute practice from the floor, at least some of the time, for practice from the blocks.

It should be noted that the above kind of program is appropriate once the athlete has developed at least some basic skills in the various exercises through more frequent practice with light loads.

**Longer Term Training Plans and Their Exercise Content**

Many coaches like to plan general approaches to training for periods ranging from months to years. Naturally, these programs need to be modified as results unfold, but the long term plan creates a clear picture of what the athlete’s developmental goals are. So a coach might plan to have the athlete train 11 months in the first year for an average of three times per week, after which there is a break in training for a month, or a month of reduced training, when other sports are practiced. Then, in year two, the athlete plans to train for 50 weeks and use four workouts per week. In year three, workouts might be increased to 5 per week and two weeks are scheduled for light, rather than no training, and in year four, 6 day per week workouts become the standard. In year five, morning workouts might be added three days per week.
There are many approaches to this gradual increasing of training volume. At the two extremes are coaches who work to build lifters to a volume and frequency of training that is considered optimal. Other coaches take the position that increases in training load will only be made when lifters begin to stagnate at the existing level of training on the premise that doing the least one can to improve is a better approach than proceeding to a preplanned level of training. Both approaches have met with success.

Similarly, there are fundamental differences among weightlifting coaches about whether all training should be highly specific. For instance some coaches have their lifters doing snatches, cleans, jerks, and front squats almost exclusively. This is often referred to as the “Bulgarian” approach which was popularized by the legendary Bulgarian coach, Ivan Abadjiev.

At the other end of the spectrum are coaches who use as many as 100 different exercises across a training year, on the premise that variety is stimulating to the organism and that anything that is given up in terms of specificity by high variety training is made up by greater mental and physical stimulation. This is often referred to as the “Russian” approach, and one of its most well known and widely published practitioners was former world champion and USSR national coach, Alexsei Mevedyev.

Such coaches also tend to believe in the use of certain skill building drills, sometimes in exercises that are only tangentially related to lifting itself, such as jumping and even sprinting. Still other coaches believe in bodybuilding kinds of exercises to balance the strength and development of muscles throughout the lifter’s body. Outstanding results have been achieved by both the more specific and the higher variety approaches. And it is clear that many individual athletes react more favorably to one approach or the other, or to something in between these approaches.

A final example of disagreement among coaches, though certainly not the only remaining one, arises in the area of frequency of heavy training and the intensity to actually be reached in training. Many coaches believe in having their advanced athletes perform heavier lifts in training than are expected in competition and to go as heavy as they can as often as they can.

Other coaches expect that, generally, their athletes will lift their absolute maximums in competition and that pushing to maximums should only be an occasional phenomena in training with most workouts performed with sub-maximum weights. Again, success has been achieved with both approaches, or a blend of the two.

Perhaps the most creative coaches assume that each athlete is different and, therefore, different athletes benefit from different approaches. So the coach and athlete explore different approaches together and work to discover the methods that are best for each athlete.

Among the more popular approaches to longer term planning is the concept of “periodization.” Under periodization, training volume and intensity is varied through such manipulations as changing exercises, weights, repetitions, and sets in a cyclical fashion that progresses in a largely preplanned manner over time. More and less stressful training sessions and weeks are alternated in some fashion to produce or generate a training stimulus, while at the same time avoiding overtraining. Many believe this type of training to be the most result producing and progressive.

For example, a relatively short term plan for 4 weeks of training is embedded in a plan that is 12 weeks long. The plan assumes that athletes have reached the point where their maximums for a single repetition have been measured and the workout plan expresses the highest training intensity during these weeks in terms of percentages of the aforementioned maximums as follows:

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity</td>
<td>65%</td>
<td>75%</td>
<td>70%</td>
<td>80%</td>
</tr>
</tbody>
</table>
In these respective weeks, the athlete might perform 2 to 3 reps in exercises requiring significant technique such as snatches and cleans, but 4 to 6 reps in strength related exercises.

Note the cyclical and undulating variation of intensity of the training period. A lighter week is followed by a heavier week in weeks one and two. Then a lighter week is carried out in week three although it is heavier than what was done in week one. Finally, week four is the highest intensity week yet. Also, note that while the maximum percentage is 80%, that is 80% of that lifter’s maximum for a single lift. However, such a weight is being lifted for 2-5 reps. That means the effort required on the last rep in the set will be significantly greater than the effort to lift 80% of the lifter’s maximum for a single lift because of the fatigue that builds up as the lifter performs the earlier reps in the set.

There might then be a second four week cycle structured as follows:

<table>
<thead>
<tr>
<th>Intensity Level</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70%</td>
<td>80%</td>
<td>75%</td>
<td>90%</td>
</tr>
</tbody>
</table>

In this second four week cycle, the repetitions performed in the skill related exercises might be 5 reps in the lighter sets and 1 to 2 reps in the heavier sets of each workout and week, while in the strength related movements the reps might have been reduced to 3 to 4. Weeks five and six are similar to weeks three and four, but weeks seven and eight bring the intensity of training up to a higher level than during the earliest weeks in the 12 week cycle, one that approaches the lifter’s maximum ability.

There might then be a third four week cycle structured as follows:

<table>
<thead>
<tr>
<th>Intensity Level</th>
<th>Week 9</th>
<th>Week 10</th>
<th>Week 11</th>
<th>Week 12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80%</td>
<td>90%</td>
<td>85%</td>
<td>100%</td>
</tr>
</tbody>
</table>

In the third four week cycle, the repetitions performed in the skill related exercises might be 1 to 2; while in the strength related movements, the reps might have been reduced to 2 to 5. Week nine might be viewed as a week where stimulus is presented by neither a high volume nor high intensity such as performing four sets of two reps with the highest weight of the day. In week 10, both the volume and intensity might be higher with the athlete performing five sets of three reps. Then the athlete might reduce both the volume and intensity in week 11 by performing three sets of singles with the top weight. Finally, in the maximum week, the athlete might do two to three singles with the top weight.

So the volume from week to week might vary by 20% along with the changes in intensity. This process alternates loading with unloading which is one of the most effective ways to assure long term progress.

In another variation, across a twelve week cycle, the intensity is gradually and generally increased while the volume moves in the opposite direction, as follows:

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vol. (reps)</td>
<td>240</td>
<td>285</td>
<td>250</td>
<td>300</td>
<td>205</td>
<td>250</td>
<td>210</td>
<td>260</td>
<td>170</td>
<td>210</td>
<td>185</td>
<td>220</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intensity Level</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>Week 10</th>
<th>Week 11</th>
<th>Week 12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>65%</td>
<td>75%</td>
<td>70%</td>
<td>80%</td>
<td>75%</td>
<td>90%</td>
<td>80%</td>
<td>90%</td>
<td>85%</td>
<td>90%</td>
<td>85%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Here, during the twelfth week, the athlete is scheduled to attempt a maximum, but only if the athlete feels up to it and not more than two or three times. But if the athlete does not look like he/she is ready for a maximum, a lighter week can be performed with an eye toward a maximum week the following week. Similarly, if the athlete looked great in week 10 with 90% weights, the coach might opt to make that a maximum day.

**Workout Structure at Six to Twelve Months**

In terms of the structure of the daily workouts themselves, after a lifter has been training for six to twelve months, the workouts might look something like the following, after some light warming up:

**Monday**
1) Snatch from the Power Position, Mid-Knee and the Floor (one rep in each position each set, for a total of 7 sets, including warm-ups);
2) Jerk from Rack for 6 sets of 2 reps, including warm-ups;
3) Clean from the Floor for 5 sets of 3 reps, including warm-ups;
4) Front Squat for 5 sets of 3 reps;
5) Military Press for 3 sets of 5 reps;
6) Flexibility exercises for any areas identified as deficient during assessment and one set of some abdominal exercise.

**Wednesday**
1) Jerk from the Rack for 5 sets of 5 reps;
2) Clean using the same warm up approach that was used on Monday for the snatch;
3) Snatch with same reps and sets and Monday’s workout in the clean;
4) Press in Split Position for 5 sets of 5 reps;
5) Squat for 5 sets of 3 reps;
6) Flexibility exercises along

**Friday**
1) C&J for 8 sets of 2 cleans and one jerk;
2) Snatch for 6 sets of 2 repetitions;
3) Press in Snatch Position for 4 sets of 5 reps;
4) Front Squat for 5 sets of 5 reps;
5) Flexibility exercises for any areas identified as deficient during assessment and one set of some abdominal exercise.

This is a very simple illustration of the long term programming that many coaches use. It should be noted that often, during periods when volume is high, the variety of exercises performed is greater. In contrast, toward the latter part of the series of weeks or months in a training period, when intensity grows and volume declines, exercises tend to be more competition related (more snatches and C&J’s and fewer supplementary exercises).

The above program would generate medium to higher volume and might be used toward the earlier and middle stages of the 12 week cycle. As the end of the cycle approached, the presses in the split and snatch positions might be dropped and the snatch and cleans in three positions might be replaced by pure snatches from the floor. The higher volume and variety period is often referred to as the “preparatory” period and the latter, higher intensity, lower volume, and lower variety period is often referred to as the “competition” period and a completion would typically occur at the end of the 12 week cycle.

As a lifter progresses in experience, skill, and conditioning, the program can become more complex and the number of training days increasing until the athlete is typically training six days per week. Eventually, the lifter may train twice a day on at least some training days.

However, the coach should remember that the true goal of training, especially at the beginner and intermediate level, is to provide a training stimulus that improves the athlete’s skill, strength, and absolute intensity, as the lifter is progressively by using heavier weights, and improving his/her overall conditioning in terms of developing the ability to handle a greater training volume, so that more time can be spent in honing the lifter's technical skills. It is not to increase volume and intensity merely for the sake of doing so. Some athletes can go heavier more often than others, and athletes vary significantly in their tolerance for volume. Therefore, the athlete’s response to the training stimulus must be carefully monitored for any signs of overtraining or overuse symptoms, sluggish movements, inability to lift heavier weights, and continually sore muscles, tendons or joints. Such signals should be heeded and addressed by reducing training volume and/or intensity. Neither of these two stimuli should be increased suddenly and in a sustained manner without lighter workouts or weeks included, or the risk of overtraining or overuse will be significantly increased.
But this can be accomplished in other ways as well. Some coaches keep volume relatively stable throughout the training process but vary top weights considerably from day-to-day and week-to-week.

Other coaches do not plan the percentages to be lifted each workout by more advanced lifters, but rather they rely on observation and the athlete’s report on how he/she feels to determine the training load for a given day, with the objective of always approaching the athlete’s maximum capability for that day which may be significantly lower than the athlete’s best.

However, regardless of method, only undulating and gradual increases in training volume and intensity should occur, along with careful observation so that plans can be adjusted to the reaction seen in the athlete, as very definitely one “size” does not fit all athletes.
It is important for new coaches to learn a few general concepts about coaching in addition to learning the technical aspects of weightlifting technique and training. Therefore, in this section of the course, we present some of these basic and general concepts of coaching.

First – Do No Harm

Much like a physician, the coach’s first commandment is to do no harm. The coach is there to guide the athlete through the exciting and positive journey of mental and physical development that comes through weightlifting training. Every athlete wants to win and so does every coach, but not at the expense of an athlete’s health. Quite the contrary, proper training should enhance one’s health and healthier athletes are far more likely to reach their potential. However, some coaches, in their effort to develop champion lifters, are tempted to push new athletes to the point where their health is endangered. This is both morally inappropriate and practically ineffective. One of the most common causes for lack of progress among lifters is injuries. As has already been mentioned, Weightlifting done correctly is a very safe sport, particularly in terms of catastrophic injury to the head, spinal cord, and joints. Nevertheless, athletes, who fail to progress gradually, who do not take the time and exert the effort to learn proper technique, or who overtrain their bodies consistently, are subject to injuries that can both threaten an athlete’s health and hamper progress significantly.

Training for high performance in Weightlifting is very hard work, perhaps some of the hardest work one can ever do. But some coaches mischaracterize this hard work concept by repeating the old adage of “no pain no gain”. However, coaches need to understand that the word “pain” has a very specific meaning in that adage. It means there is no gain without profound mental and physical effort at times and, perhaps more importantly, single mindedness of purpose over many years with extended periods of minimal progress. Applying this kind of effort over the long term is a process some consider “painful”. Yet without such excruciating effort, one cannot reach the highest levels of performance. And that notion is true. On the other hand, the concept is inappropriately used by some as justification for trying maximum weights when one’s technique is not been well developed, or ignoring clear signals from the body that one is overdoing it, or hurt (injured) in some key lifting muscle or joint. This is a complete misapplication of the concept, one that is dangerous.

Beginners and intermediate athletes may experience muscle soreness and mild joint discomfort as their bodies adapt to their training. However, this should be an occasional occurrence and not a chronic situation. If pain is significant or lasts more than a workout or two, it is a critical signal to the coach that the athlete is progressing too rapidly for his/her own body, or that technique is faulty, or both. In such a case, it is important to identify the cause of the discomfort and eliminate that cause; at least until the discomfort has subsided. Then the athlete can resume training with a revised approach.

The Stages of Motor Learning and Consistency

The learning of a new skill is often described as a three step process: cognitive, associative, and autonomous. During the cognitive stage, the athlete is learning in a conscious way what is to be done and how. Performance can improve dramatically during this period in terms of approximating a correct movement pattern, but it tends to be erratic and movements may not be optimally timed. During the associative stage, the athlete is learning by going through the motion and receiving feedback that enables him/her to refine the performance of the skill. Finally, in the autonomous stage, after much practice aimed at correct and consistent performance, the motion becomes virtually automatic; the athlete is able to perform the skill correctly without conscious direction. This latter stage is in some sense desirable in that efficient and consistent performance has been achieved if the skill was learned properly. But if no conscious effort is applied to improve the skill any further, it will stagnate. So while consistency is in many ways desirable, it inherently limits improvement. Therefore, while the lifter should always strive for consistency of proper movement, there is always room for improving certain aspects of the skill. For instance, the lifter can never move fast enough from the explosion in the pull to the movement under the bar, any more than he/she can become too strong or powerful. So the dual goals of improving consistency, while making small changes in finer technical movements, must be relentlessly sought.
**Progressing Gradually and Appropriately**

Another aspect of positive coaching is to assure that athletes, especially beginners, proceed in a success orientated environment. That means introducing athletes to the sport with exercises that present a challenge, but have a reasonably high probability of successful performance with sufficient focus and effort. Such exercises are the progressions already discussed. Each of those progressions require less complex skills than the competition versions of those lifts, skills that can be learned by the beginning athlete, yet they present a significant challenge at the same time. In addition, the mastering of each progression will help the athlete to a step toward mastery of the complete skill set that is required to perform the full competition version of the lift (the snatch, the clean, or the jerk).

As the athlete masters each part of the full movement, further complexity is introduced. By proceeding in this kind of step by step fashion, the athlete always has an opportunity for success while at the same time experiencing an incremental challenge. Such a process also helps to keep the athlete’s confidence and interest level high.

As has been noted above, proper weight selection is a critical element of incremental improvement in the ability to perform the lift correctly. For beginners, starting all the basic exercises with a stick, light bar, or regular bar is appropriate. Weight can be added in low skill exercises, such as squats and presses, fairly quickly, but on the more complex lifts, use of the empty bar may continue for several workouts or several weeks, or more.

The rule of thumb is to never add weight if the movement pattern is incorrect and reduce the weight if sets with lighter weight were being performed incorrectly and the addition of weight seems to lead to a technical breakdown. The only exception to this is a situation where the load is so light for that athlete that he/she cannot feel resistance at all and, as a consequence, flings the bar or stick around in artificial positions because of the exceptionally light load. In such a case, the load may be increased gradually until a more normal pattern of movement can be established.

**Long Term Development**

It takes at least 5-7 years of serious and progressively more strenuous training in the sport of weightlifting for an athlete to approach his or her ultimate potential. Athletes typically begin by training three days per week and, over a period of years, increase the frequency of their training to six days per week, often twice a day. The weights lifted by beginners are lower in terms of volume in intensity relative to what they will be later on in the athlete’s career. Initially, the focus is on learning technique, and while for the wise lifter this process continues throughout much of his/her career, more advance training begins to include an emphasis on technical consistency, strength, and power development.

In addition to going through the training development process already discussed, young athletes are going through the simultaneous process of growth and maturation. Their bones growing to their full length and density, their nervous systems are becoming more complex and refined, and they are moving toward their adult level of muscular development (all of these processes augmented by the training they are doing). As this maturation process unfolds, there are periods during which the young athlete is especially receptive to certain kinds of training stimuli and the knowledgeable coach works with the athlete to optimize these opportunities. There are other challenges as well. For instance, the athlete’s individual mechanics change in connection with their bone growth, though not the fundamentals. Similarly, as the athlete’s mind matures, he/she may experience changes in values and emotions from what the coach initially encountered. But, overall, growth and maturation present great opportunities.

Long term development is a complex subject well beyond the scope of this manual, so we urge new coaches to learn more through some of the references that appear at the end of this manual, and through more advanced USAW courses.

**Direct Attention and Action**

It is important that any coach establish control over the group he/she is working with. Without that, it will be difficult to provide instruction and assure safety. One of the most effective means to establish control is to direct the attention of athletes and get them into action.

Having beginning athletes observe with the absence of any direction is very limited in value. They do not know what they are looking for or how to interpret what they are seeing. They need guidance from a coach.

Similarly, extended lectures without any action are of limited value when they pertain to activities. It is one thing to talk about how to do a certain exercise and quite another to experience the performance of that exercise. Therefore, it is fine to lecture briefly about how and why a certain exercise is done a certain way, but it is unwise to spend more than a few minutes in the uninterrupted lecture mode. Athletes, especially young ones, need to get moving. Many of the concepts introduced during long lectures will be forgotten by the time those lectures are over, so there is little point in conducting them.
Keep Your Instructions Simple and Succinct, and Prioritize Them Carefully

Coaches who are well educated often have a tendency to use technical jargon when they speak to athletes. Such coaches should use such terms only during informal or classroom instruction if they are sure that everyone in the audience understands the jargon they are using, not during training sessions. For instance, instead of stating, “Correct execution of the power position entails the activation of the stretch reflex to extend the quadriceps and plantar flexors;” the coach might say, “As the bar reaches the power position, you explode with your legs to throw the bar upward as quickly as possible.”

When the coach is introducing an exercise for the first time, it is important to name the exercise and explain its key characteristics and purpose. Also explain the use of any special equipment that is needed to perform the exercise and any special safety precautions that are appropriate. Then demonstrate the exercise to the athletes, while a narration explains the salient points of the exercise, such as the start position, key movements occurring during the exercise, and when the exercise ends. The introduction should also explain how it helps to improve the athlete’s performance (i.e., why the exercise is being done).

In addition to keeping instructions simple and succinct, it is important for the coach to prioritize instruction. For instance, a coach may be able to see that an athlete doing many incorrect movements when that athlete performs an exercise. There is often an urge to point out all of those mistakes at once. But that is, in itself, a mistake. Changing movement patterns is no small challenge for the brain of an athlete. Focusing on a single error presents ample material for the athlete to focus on. Asking the athlete to correct multiple errors at once is generally expecting too much.

Exceptions to this are instances where correcting one fundamental movement pattern will address multiple errors at once. But even in those cases athletes are being asked to focus on that single fundamental compared with focusing on all of the resulting corrections.

Therefore, it is important to choose your area of focus appropriately. The first and most absolute guideline is to concentrate first on errors that affect safety. In the case of such an error, either correct it quickly or change the exercise so that the error in question will no longer affect safety. For example, if an athlete is not locking the elbows when a snatch is overhead in a squat position, that can be dangerous. Therefore, either that problem needs to be corrected immediately, or the athlete needs to perform power snatches until the lockout problem in the squat snatch can be corrected with various forms of stretching, the practice of overhead squats and perhaps repositioning the elbows so that the effects of a poor lock are mitigated.

Second, concentrate on the most fundamental errors, i.e., those that cause one or more additional errors. An example is an athlete who is very inconsistent in the pull and the bar is not close to the body, while at the same time the back is rounded. In such a case, it is likely that correcting the rounded back will serve not only to protect the athlete’s back from injury with a more mechanically sound position but, with the correct torso position, the bar will likely come closer to the body and consistency will improve. This is because a torso that is rounded will likely round to different degrees from lift to lift, but the universal posture of weightlifting is always the same as it contributes to the development of consistency.

Only after the safety related and more fundamental errors have been corrected should the coach’s focus be turned to correcting other errors, in priority order.

The Importance of Identifying and Prioritizing Errors

The coach must become an expert at error correction if he/she is to teach correct technique to athletes. This process takes time, but some simple guidance will enable the new coach to become effective quickly. Begin by comparing actual performance to the model of correct performance that you have been given in this course. Also, be aware of the common errors that have already been explained and their causes.

Next, if the error occurs in the starting or receiving positions of the lift, and you have established the lack of flexibility is not the problem, you should go over the basics of the correct positions with the athlete. Give the athlete real-time feedback on his/her positioning relative to what is desired. For instance, an athlete whose back is rounded at the start of the pull may simply not realize what it feels like to be in the correct position in relation to the incorrect one. Such an athlete will typically benefit immensely from being able to see his/her body in the incorrect and correct positions and learn to feel the difference. A great way to accomplish this is to set up two mirrors, as was described in the section of this manual on the deadlift stretch, enabling the athlete to see the position of his back while looking straight ahead. If the position is incorrect, the coach should work with the athlete to place him/her in the correct position, then have the athlete see that position and feel what it feels like to be in that position. Sometimes, closing the eyes to focus on feelings as opposed to visual cues, can be helpful in this process. Once the athlete begins to associate a certain feeling with the correct position, he/she will generally be well on the way to correcting the problem.
Other common causes of problems are 1) incorrect balance, as the balance may be on the toes or heels when it should be in mid-foot or the opposite; 2) wrong angles of body levers relative to the floor or each other, when the torso is nearly parallel to the ground at the start of the lift, rather than being angled at between 25 and 50 degrees (the torso will tend to be more upright in the clean start than in the snatch start); 3) muscles are inappropriately contracted because the arms are bent at the start of the pull, or the shoulders are shrugged; 4) wrong timing, such as taking the bar off the platform rapidly or dipping for the jerk too rapidly. The best approach to error correction usually involves identifying all of the major errors and picking the one that is most fundamental and/or earliest in the sequence and try to correct it.

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athlete to learn how to do this, it is best for that athlete to wait for a few moments to recall and assess a motion and then to receive feedback, because a comparison can be made between what the athlete felt and what actually happened. Another method for building an athlete’s ability to self-assess is to gradually withdraw feedback, so that the athlete becomes more and more self-sufficient over time with respect to the movement being worked on. The importance of feedback pertains to strength and power improvements as well. If you can not measure results, you will not know if you are improving, but weightlifting naturally provides this feedback with measurable weight on the bar for each set.

**Training Alone, Especially by Beginners, Should Be Discouraged**

Although it is not unusual for advanced lifters to train alone at times, this practice should be discouraged for any lifter and simply not permitted by beginners. Advanced lifters know what they are doing and they proceed along with reasonable safety, although the presence of a coach or training partner is always preferred. In the case of beginners, a lack of knowledge of sound training principles and technique absolutely precludes unsupervised training. If an athlete must train remotely from the coach from time to time, it may be possible to have a parent or other athlete provide appropriate instructions and supervise the workout. However, maximum attempts should never be made outside the presence of the coach and the planned workouts must be adhered to unless conditions encountered during the workout suggest that the workout should be shortened, lightened, or terminated.

**Follow the Planned Program**

It is important for athletes to follow the planned program. However, following the plan does not mean slavishly carrying out every set of every exercise that was planned if there is some good reason to modify the plan. For instance, if the athlete is showing signs of significant, or is consistently not performing lifts correctly, or if any pain is encountered during the performance of the lift or exercise, the workout may be shortened or lighter weights may be substituted. Alternatively, a different exercise may be substituted. In extreme cases of apparent fatigue, or where pains persist or worsen, the workout may even be terminated.

There may also be times when the athlete will go heavier or perform more sets of an exercise than was originally planned. For instance, if the athlete’s technique is looking very good and the weight relatively light, a heavier set or two might be taken. Alternatively, if the athlete appears to be grasping a technical learning point for the first time, an extra set or two might be added to provide the athlete with the opportunity to reinforce the learning of that point. But, in general, the workout plan should not be deviated from, and especially not because the athlete sees other athletes doing something different or just because the athlete “feels like” doing something different. The development of weightlifting ability is a process that occurs over many training sessions and requires patience. Therefore, consistent application of the plan is important for long term development.

**Dealing With Injuries and Other Health Issues**

While serious injuries are quite rare in Weightlifting, the possibility always exists that such an injury can occur, or that another emergency health problem that is unrelated to weightlifting can arise during training. Therefore, it is important to have a plan to summon emergency help to the lifting venue immediately, and it is useful to have emergency contact information for each athlete.

For less serious injuries, such as skin abrasions and mild strains or sprains, having a first aid kit and ice on hand is a good practice. From time to time, skin tears on the hand or abrasions on the shins result in blood being deposited on the bar. In such instances, a disinfectant that kills blood borne diseases, such as Clorox (not Clorox or other wipes, which may not contain Clorox), should be used to clean the blood from the bar. Once this has been done, the bar can be dried and then have light layer of chalk applied so that athletes will not have to deal with a slippery bar.

**Fostering a Winning Attitude**

Perhaps the single most important contribution that a coach can make to an athlete’s career is helping the athlete believe that he/she can improve and win. From basketball’s John Wooden and Pat Summit, to football’s Vince Lombardi, to wrestling’s Dan Gable, to weightlifting’s Ivan Abadjiev, great coaches work to help their athletes believe that they can be successful, that they can win, that it is right to dream, and that the only real failures are failures to learn and try again.
In this section of the manual we will be discussing equipment typically used for training weightlifters. One important piece of equipment has already been discussed at length in the chapter on the exercises used in weightlifting training — the squat rack, so we will not repeat that discussion here. Instead we’ll discuss other important equipment that has already been seen in use but not separately explained, such as platforms, barbells, organization of the training space, and the attire of weightlifters.

Good weightlifting equipment generally lasts for a long time but all such equipment must be used correctly and maintained. Therefore, regular inspections of the structural integrity of equipment must be carried out, and if any equipment used begins to lose its functionality, it must be repaired or replaced promptly.

Platforms
The practice of weightlifting requires very limited equipment and space, and the cost of such equipment, which lasts for a very long time, is reasonable. The basic training space is typically referred to as a training “platform.” In the USA, this is typically a surface that is 8’x8’. It is generally made out of wood and stands 1.5” to 3” high. It must be completely flat and level, firm and have a non-slippery surface that allows for foot movement by foot sliding, but also provides solid footing when the feet are placed in their final position for catching the bar at arm’s length or on the shoulders. The center of the platform is where the lifter stands.

Nothing should ever be on the platform except the lifter and the barbell, no plates, no racks, no blocks (unless such equipment is being used for the exercise currently being performed — the use of blocks is explained in more advanced courses), and never people (except spotters being used as already described, or a coach who is supplying hands on instruction regarding a lift, with such instruction never occurring when the lifter is using more than light weights). This code must be strictly enforced by the coach because the safety of the athletes hangs in the balance. One or more of these items on the platform, and an endless number of others, can cause an athlete to trip, be struck by a ricocheting barbell, be caught between the barbell and the object, or damage the barbell or other object.

IX. Equipment and its Proper Use
The ceiling in the room that houses the platform should be approximately 8’ high to allow for even relatively tall lifters to clear the ceiling with a weight overhead. Platforms of the kind described above should have at least a 24” perimeter on all sides between the platform and walls, weight racks, and other platforms. The front and rear areas of this 24” perimeter afford some space for the barbell to land when a lifter who runs to the edge of the platform to control a lift cannot keep the barbell from falling.

Lifters should be taught that if, during the execution of a lift, they ever begin to approach the end of the platform, or an object like a rack, it is better to drop the lift than to risk a collision with the rack or a misstep in walking off the platform. Many newer platforms are set flush with the floor to avoid this latter kind of risk with the thickness of the platform itself being sunk below the floor level.

Barbells
Over time, the design of barbells has been improved to maximize the performance and safety of lifting. The bar itself turns freely within outer sleeves upon which the plates are loaded. This freedom in turning the bar, no matter how heavy the weight being lifted may be, facilitates the turning over of the hands from the pulling to catching position in the snatch, and the hands and elbows from pulling to racking in the clean.

Modern barbells are built to flex and return to their straight position when heavy loads are lifted and this “spring” of the bar can be used to increase performance (a topic beyond the scope of this manual).

Finally, the diameter of the plates has been designed both to position the bar at a height that makes it relatively easy for a lifter to assume a good starting position, and to keep the bar clear of the lifter in the unlikely event the lifter cannot drop the bar clear of the body when a lift is missed. In such cases, if the lifter lies flat and turns the head to the side, the bar will not contact the athlete’s body (although, as has already been explained, there are much better ways to miss that should be learned early on in the lifter’s career).

Barbells should always be correctly and evenly loaded. It is always the responsibility of the athlete about to lift to assure that the barbell has been loaded correctly. In this way, there is no doubt about the weight to be lifted and who is responsible for assuring that it is correct. This is a good practice for competitions as well, because a mis-load
can occur, even at the highest levels of competition, and sometimes only the athlete notices the mistake before the lift is attempted.

Most modern barbells that are designed for Olympic-style weightlifting have tight enough tolerances between the plate holes and bar sleeves that the plates will not generally shift when the barbell is being lifted without the use of collars. An exception to this occurs when humidity is high, which can cause even tightly machined plates slide on the outer sleeves of the bar. In such a case, collars should be used. It is also appropriate to use them for maximum attempts, or if for any reason the tolerances between plate holes and bar sleeves are not tight enough to prevent plate shifting while lifting or dropping the bar.

Bars should be straight and the sleeves on either end of the bar that receive the plates must turn freely around the bar. Bars also should generally be stored horizontally instead of vertically, to assure that inappropriate sideways forces are not applied to the sleeves or bearings of the bar.

The Training Room and Other Equipment

The training area should be well heated and not drafty. It should be cleaned regularly and plates replaced on racks or other designated storage areas. As was suggested earlier, equipment should be checked regularly to assure that squat racks, blocks, and other apparatus are stable. Any pins used with them should not be worn to the point where they are weakened or bent.

“Chalk” or magnesium carbonate is an important training provision. Athletes use it to create a thin coating on the hands before attempting heavy snatches and cleans, which helps the athletes to maintain a firm grip on the bar. It can also be applied to the shoulders before performing heavy jerks, to help keep the bar from sliding on the shoulders during the dip for the jerk. Rosin is also often used for the feet when athletes are lifting on a hard wooden surface to assure that the athlete’s foot will not slide once it contacts the platform.

A “squat” rack, power rack, or cage is one final required piece of training equipment, the use of which has already been explained in this manual.

Organize and Teach the Athletes and Observers

When you are training groups of athletes larger than 4 or 6, it is best to divide the athletes into groups of 5 to 5 to a platform. With this arrangement, one athlete can lift while the others on that platform observe and, in the very limited cases already noted, spot the lifter. In addition, the lifter who is about to lift can focus solely on lifting while the others load the bar for that lifter, observe and cheer the lifter on.

For instance, if lifter A is preparing to lift, lifters B and C load the bar. When lifter A has completed a lift, lifters A and C load for lifter B. When lifter B is done, lifter C prepares to lift and lifters A and B load the bar.

Lifters not lifting at any particular point in time should learn never to walk in front of an athlete while that athlete is performing a lift or is at the bar preparing to lift. There should be no idle chatter, music, or other distracting noise. Earphones should not be used while lifting as they could distract a lifter, or preclude his/her hearing instructions from the coach, or hearing a warning of an imminent danger, such as walking back off the platform or colliding with another lifter.

When there is more than one platform, the coach moves from platform to platform during the workout so that each group gets attention multiple times during the training session. It is important for the coach to maintain an awareness of what is going on at all other platforms, so that if something unsafe or completely inappropriate develops, he/she can address whatever is occurring immediately.

Observers should remain quiet, unless they are cheering the lifter on. There should be no coaching by observers. If they have a suggestion, it can be relayed to the coach but never directly to the lifter, and especially not immediately before the lifter is about to lift, as any suggestion may conflict with or at least distract an athlete from instruction provided by the coach.

It is also extremely beneficial to teach each and every lifter how to coach others. Not only will such instruction help athletes to better understand what the coach is trying to do with them, but it will enable the coach to handle athletes, with help from many “assistant coaches”. Each athlete who learns to think like a coach will gain a greater grasp of technical concepts that will likely prove useful to his/her own lifting. If there are three or more lifters on a platform, lifter B who will immediately follow lifter A, who is currently lifting, should generally be exempted from observing the current lifter A so that lifter B can concentrate on his/her own upcoming attempt.
One additional point on an athlete coaching is appropriate. No actual coaching is to be done without the express permission of the coach, because thinking about what you would do as a coach is very different from coaching. The athlete can relay any suggestions to the coach, but the coach must decide whether those instructions should be utilized and when. This practice is followed so that the athlete does not have to concentrate on two different sets of instructions at the same time.

**Footwear**

Weightlifting shoes are perhaps the most important piece of equipment that every lifter owns. Good weightlifting shoes enclose the entire foot (are never sandals), are solid, and not spongy or shock absorbing. They are flexible, reasonably lightweight and have a substantial heel (approximately 1”, often a little more), and are nonslip. Their use is mandatory in competition and should be in training. However, new lifters can use other athletic footwear, but never sandals, as long as the shoes do not have spikes or nubs that could catch when the lifter’s feet are sliding or skipping along the platform to reposition them.

Lifting shoes provide a firm footing and help the lifter to assume a full squat position comfortably. They should be kept in good repair by not letting the heels wear significantly or permit the soles to become slick. Shoelaces should be kept in good repair. Check them carefully before any competition because a break in a lace prior to a heavy lift can be a real problem. They should fit the foot relatively closely but not feel tight or pinch, nor should the toes contact the front of the shoe when the feet are stamped down.

**Straps**

Straps are used by many lifters, particularly those who train every day for exercises such as snatches and pulls. They can help to reduce the stress on the skin of the palms and fingers as these areas may become irritated by frequent training. However, lifters must be careful not to become overly reliant on the use of straps to support the grip. This is because straps are not permitted in competitions and lifters must be able to lift maximum weights without their use.

One other point should be made regarding straps. They must never be wrapped around the bar more than once. This helps to assure that they can be released quickly in the event of a missed lift by simply opening the hand. It is strongly recommended that straps not be used in the clean, since if the athlete should have the misfortune of catching the clean with low elbows and compress and trap the elbows and wrists on the legs. In such a case, getting rid of the bar when it has been secured with straps can be difficult. Use of straps on snatches is less problematic and more common.
Clothing
It is important for lifters to wear appropriate clothing in training, and special clothing such as a singlet when they compete. The latter will be discussed later in the section of this manual that covers some of the more important and basic rules of Weightlifting.

It is advisable for lifters to wear full-length sweatpants or tights in training. Shorts can be worn over these. The purpose of the full-length pants is to keep the legs warm and to reduce the likelihood of skin abrasions from the contact of the barbell against the shins and thighs. At a minimum, long socks and bicycle type shorts should be used for this purpose. Stretchable clothing that is not restricting (e.g., no jeans) and is relatively formfitting is important, so that the lifter can move freely and the bar cannot be caught on the clothing. For the same reason, lose waist strings should be tucked into the waistband.

Hand Care
As a result of the skin irritation that occurs from extended lifting with the barbell in the hands, calluses will build up on the hands, most typically on the palms near the bases of the fingers. If the calluses become too thick, they will catch on the bar and may be torn loose from the underlying skin. While such an injury is not serious in nature, it is quite painful. Apart from the immediate discomfort of the pain is the problem that further lifting will be difficult, as the athlete is distracted by that hand pain. Therefore, it is appropriate for lifters to reduce the thickness of calluses by using a pumice stone or a similar appliance after taking a shower, to pare down the calluses. Use of non greasy skin lotion after a shower can also help keep the skin on the hands in good shape (e.g., CeraVe or Eucerin Daily Skin Balance lotions). Hand care is particularly important prior to competitions, as a callous tear during a competition can undermine competitive performance by distracting the lifter.

First Aid Equipment and an Evacuation Plan
It is always good for any training facility to maintain a first aid kit with such items as band aids, soap, and antiseptics. Having someone on hand who knows CPR is a good idea and having a defibulator is even better. But perhaps the most important safety precaution for any training facility is having an evacuation plan, so that anyone who falls ill or becomes injured can receive trained medical attention as rapidly as possible.
X. The War Against Drugs

The sport of Weightlifting, especially in the US, is deeply and fundamentally opposed to the use of drugs in sport and in general. We believe our athletes should be able to compete on a level playing field against other athletes who are similarly drug free. This is essential for the safety and health of our athletes. It is important in protecting the public image of our sport, which has in the past, and even up to today, been tarnished by athletes and coaches from certain countries who continually attempt to circumvent the rules to achieve undeserved victory, regardless of the costs.

It has been amply demonstrated by science and practical observation that certain performance enhancing drugs can have unhealthy effects on athletes. Anabolic steroids have been linked to cardiovascular disease and various forms of cancer and can place athletes at greater risk for injury. When the use of anabolic steroids was rampant, avulsions of tendons were relatively commonplace, whereas today they are quite rare.

The use of drugs is also fundamentally unfair because those who use them have an advantage over athletes who do not; although the magnitude of that advantage, especially under today’s doping testing conditions, has been greatly exaggerated. In fact it is that exaggeration that makes drug use so mistaken. Any small advantage drugs may yield is more than offset by the disadvantages such usage presents which is even more reason to ban the use of drugs in competition. Why cheat when there is so little to gain?

In many ways, drug prohibitions are a form of mutual disarmament. We all agree not to use drugs but rather to compete drug-free by using better training and technique as our only weapons in the battle for improved performance. As a result, the health of athletes is not placed at risk when there is so very little to be gained by cheating and much to be lost, including the reputation of our great sport.

There are several reasons why the advantage has become relatively small. First, testing at competitions has become so refined that athletes who are taking drugs must stop taking these drugs weeks before the competition, so by the time of the competition, much of the advantage conferred by the drug has worn off. Second, the advantage conferred by drugs is largely associated with their ability to help athletes gain muscular bodyweight. But in the sport of Weightlifting, where all but the athletes in the unlimited bodyweight divisions must control their bodyweights, the benefit of any drug is relatively small.

Then there is the psychological disadvantage suffered by cheaters. As they prepare for competition, they know that once they stop taking their drugs they grow weaker with every passing day. Imagine the pressure felt by an athlete who knows that with every minute ticked off by the clock, his/her strength is waning and performances achieved in training cannot be approached. Compare this with the attitude of a lifter who looks forward to competitions as a place to perform at his/her personal best.

Consider also the mental stress suffered by those who cheat. They worry before the competition about being caught before or at the competition. They worry at the victory ceremony whether their “victory” will remain. They worry after the competition whether their samples will test positive, and how the fame they enjoy now could soon turn to shame. Imagine the agony of such worry, and how can you feel proud of your success if you know that it came from an unfair advantage. Of course, you can lie to yourself that “everyone” cheats, so you are no worse than them. But what a depressing thought that is, since at best you are no worse than a group of fellow cheaters.

When you train without drugs, you know that on any given day you can excel, perhaps making a personal record. When you are taking drugs, which you can never do year round, both because of testing threats and health concerns, you can only perform at your best when you are consuming the drugs, which means you will never perform at your very best in competition. Moreover, during your training, you will know that when you are off drugs your workouts will be poorer and that any chance of making a personal best is gone. So much for enjoying everyday of your training as drug free lifters do.

The USAW probably has the strongest anti-drug program of any sport in the world. Our athletes are tested at all major competitions and year round out of competition, on a random and unannounced basis. That means athletes can be tested at any time, at their homes, places of work, training quarters, even on vacation, as they must keep testing authorities apprised of their whereabouts at all times. This can be annoying, but our athletes generally welcome testing, as they are only too happy to show, at any time, that they are drug free.
At national competitions, athletes are subject to testing that occurs immediately following the competition. If they are selected to be tested, they will be escorted to the testing area where a sample will be carefully taken, recorded and securely stored until it can be transported to the laboratory for testing.

Athletes and coaches must understand the basic policy underlying our anti-doping program and all others is that all participants are personally responsible for all substances taken into their bodies, whether such substances are known by the athlete or coach to contain banned substances. If a banned substance is found in the athlete’s sample, he/she will be deemed drug positive, regardless of the cause. Therefore, all athletes and coaches must be very careful about what is consumed by the athlete. For instance, many food supplements are either produced in factories that also produce banned substances, or their makers actually add banned substances, but they do not disclose that either because of negligence or intentional deceit. Regardless of the reason, their products will cause athletes to test positive. While athletes may seek redress against such manufacturers in the courts, the presence of banned substances in their samples will cause positives that will result in penalties to the athletes. For instance, a first positive for an anabolic steroid or related substance in the USA is generally a two year suspension, and a second offense results in a four year suspension which will essentially be a career ender for any athlete, not to mention the shame and reputational damage such a finding delivers.

It should be noted that if a medication is absolutely necessary in order to maintain the health of an athlete, but is on the banned substance list (which is far wider than anabolic steroids and includes such drugs as diuretics, stimulants, and certain recreational drugs), an athlete may be able to obtain a Therapeutic Use Exemption (TUE) for that drug, provided that he/she applies to the appropriate agency beforehand. So there is much personal responsibility associated with the drug testing programs that are in place nationally and internationally today.

The USAW is very proud of its testing program and anti-drug policy, and we are doing our best to see that a program like ours is extended throughout the world. We are constantly working with the International Weightlifting Federation (IWF) to see that their anti-doping programs are improved. They face challenges that we do not because they must travel to foreign countries where border access can be restricted and athletes can be hard to locate and surprise. But the IWF is working to improve its program and we regularly advocate for improvements in testing, as do a number of other nations who have anti-drug programs similar to ours.

It should be noted that the IWF has the power to ban entire national federations from participation in competitions, up to and including the Olympic Games and World Championships, so entire nations can suffer as a result of the sins of a few.

It is beyond the scope of this manual to go into all the details of the anti-drug programs of the USAW or IWF, but more information can be obtained regarding the substances currently banned, testing procedures and the like at the USAW web-site, the United States Anti-Doping Agency web-site (USADA — the independent entity that conducts drug testing for the USAW and many other sports in the US), www.usada.org, the IWF web-site www.iwf.net and, the WADA web-site (the World Anti-Doping Agency that is responsible for international drug testing and recognized by the IWF and International Olympic Committee (IOC) www.wada-ama.org.

**Conclusion**

We hope that the information provided in this course will help you to become an effective coach. Weightlifting is a great sport and it needs and deserves great coaches. Naturally, taking any course is only the beginning of becoming a competent coach. In order to master what you have learned, you must seek to deepen your understanding by applying what you have learned many times over.

Watch the best lifters, to see how they perform. Watch the best coaches to see how they work with their athletes. You will find that most lifters and coaches are only too happy to help others in this wonderful sport.

We wish you good luck, good learning, and good results. We hope to see you at a local or national event someday, with athletes you have developed. There is nothing like the experience of helping your athletes develop and celebrate their competitive successes with them. Get strong and stay strong!
A. Preparing for Competition

Competition is the ultimate objective of most athletes, as it is an opportunity to showcase one’s skills and abilities and vie with other athletes for the recognition and awards that only competition can bring. However, it is important to assure that an athlete has a high probability of success before he/she is entered in his/her first competition, so that the experience is likely to be a positive one.

Perhaps the most important key to assuring a positive experience is to set expectations correctly. Athletes can rarely control whether they win or lose in their early competitions, as more experienced rivals will often prevail. But if a goal that is accessible to all athletes is established, every athlete truly has an opportunity to “win.” For instance, if the goal is to make at least five of six attempts, the athlete will start in the competition with a weight he/she is comfortable with and then increase gradually to the maximum level for that day. If the athlete is performing well, the top lift of the day may be a personal record, as the added adrenaline released in competition often results in personal records. But there should be no pressure to make a personal record, or to win a medal. If the opportunity presents itself for either or both, it should be taken advantage of. However, the most important factor is to put forth a good effort, to maintain one’s composure, and to have fun. If athletes learn that competition can be fun early on, it will pave the way for an enjoyable career. Lifting maximum weights is a serious business, but if one treats competition as an unparalleled opportunity to excel, as opposed to a place where you must succeed or else, the experience will be a very positive one that athletes will look forward to being involved in.

Training for Competition

Some basic approaches for the coach to follow in preparing athletes for competition are relatively simple. First, it is a good idea to replicate competition conditions in training as much as possible, especially immediately before a competition. Stage some mock competitions in the gym. Have the athletes wear the singlets they will wear in competition and have some “referees” in position to judge the athlete’s lifts, and generate signals for the athlete to replace the bar on the platform. The athletes can each make three attempts at their heaviest weights of the day, as they will in competition.

It is generally advised that maximum attempts be curtailed one to two weeks from the competition and that any heavy attempts are strictly limited. For instance, trying a maximum weight five times the week before the competition is a bad idea. Most athletes have an unloading week before the competition, so that maximum weights are not attempted in the last week to ten days.

Another general piece of advice is not to change anything immediately before a competition. Do not change your training other than the reduction in maximum attempts. Don’t change your diet and your sleeping patterns. Do not go to sleep at 8 PM if you normally retire at 10 PM. If you are not used to getting a massage, do not decide to get one the day before the competition, no matter what the benefits of a massage may be. If you want to try some new intervention in hopes of improving competition performance, do it before a heavy training session first. If it seems to work there, then you may want to try it in an actual competition.

Know the Rules

If you and your athletes have never been involved in a competition before, check the USAW website, www.usaweighthlifting.org, to identify a competition near your area. Contact the meet director to obtain entry blanks. Many local competitions permit athletes to enter the day of the event, but others do not. Even if entries need not be submitted prior to the day of the event, remember that if you have athletes who are minors, parental consent will need to be signed on the entry form by a parent/legal guardian signature. Therefore, you need to assure the entry blank of any minor has been signed prior to your leaving for the competition.

Similarly, most meet directors permit athletes to join the USAW the day of the competition and will supply paper membership forms or internet access to facilitate this, but that is not always the case. Therefore, it is always a good idea to see that all of your athletes become members of the USAW prior to leaving for the competition. They must print proof of membership and present that proof at the competition, during the weigh-in, or they will either not be permitted to lift or may have to join and pay a fee again, because meet directors are not permitted to allow athletes to lift on their mere assurances that they are members. There are a number of reasons for this, with the most important one being that the liability insurance provided to coaches and meet directors by the USAW does not cover non-members.
You should check the personal equipment of each athlete well before you depart for the competition. Apart from proof of membership, some meet directors may require a photo ID; at national competitions a photo ID and a government document such as a driver's license or passport proving one's identity are required.

In order to compete, the athlete must have a singlet which must be one piece, close-fitting, and must not cover the elbows or knees, or have a collar (other than the kind typically seen on a T-shirt). An athlete may wear a full length unitard in lieu of the singlet. All athletes must wear shoes, although they need not be weightlifting shoes. Make sure shoe laces are in good repair and bring a replacement pair that can be deployed if needed.

Those are the only uniform elements that are required, but many athletes will want to wear socks or a t-shirt, and wearing these is permitted. Socks may not go higher than just below the knee and t-shirt sleeves must stop above the elbow. No collars are permitted on an athlete's shirt other than the traditional flat t-shirt collar. Only limited bandages can be worn on the knees, wrists, and fingers and a belt of limited width is permitted (see the rules on the USAW web-site, www.usawweightlifting.org, for exact measurements). No bandages are permitted on the lower or upper legs, the arms, or the torso, and any advertising on the costume is limited in size.

Athletes will want to bring along to the meet any tape and any knee or wrist wraps they use in training. On the wrists, bandages or tape must not cover more than 100 mm of skin; any belt can not exceed 120 mm in width and must be worn outside the singlet. Knee sleeves or bandages on the knees must not cover more than 300mm of skin.

Venues can be cool, so athletes should make sure they have a warm up suit or similar apparel in order to stay warm regardless of the conditions. Liquids and food may or may not be readily available at the venue, so they should be taken along.

A checklist of items to be taken to the meet is a very good idea to assure nothing has been forgotten. In addition, it is recommended that all personal equipment needed for the competition be placed in one bag where if travel on a plane is involved, it is carried on the plane and not placed in baggage. An athlete who loses his/her shoes in baggage has a serious problem. Further information on important rules is provided in the next module of this manual.

**First Aid Kit and Other Equipment**

Band aids, soap, and antiseptics are also good to bring along, as are basic personal care items such as scissors, tweezers, liniment, nail clippers, a knife, fork, spoon, bottle/can opener, and toilet paper. While meet directors nearly always provide adequate chalk at competitions, it is never a bad idea to have some of your own.

**A Critical Pre-Competition Ritual – Weighing In**

All competitions are preceded by a weigh-in. As the name suggests, the main function of the weigh-in is to establish the athlete's bodyweight. Since Weightlifting competitions are always conducted in specific bodyweight “categories,” establishing each lifter’s category is essential. But weigh-ins involve more than just weighing the athletes. Identification of the athletes also takes place, along with verification of their USAW membership and the recording of their planned first attempts in the snatch, and the clean and jerk (the weights that the athlete is required to officially “declare” at the weigh-in). These declared weights may be changed twice, within certain guidelines, as may any weights that are declared for second and third attempts.

In the competition, each athlete will be granted a total of three attempts in each lift, and the highest successful lift in each event will comprise the athlete’s total. If the athlete is not successful with any of his or her attempts in one or both lifts, he/she will have no total and therefore will not be eligible for any awards that are given for the total (the only awards given in most competitions, certainly local ones). For that reason alone, but also because you want to assure the athlete has a positive experience, it is a good idea for the lifter to begin with a weight that he/she can lift in almost any workout, because the lifter will feel confident about the first attempt. You can increase the weight as much as you would like from your first to second attempt, and from the second to the third. So there is no need to start heavy.

The entry will indicate the planned time for the weigh-ins and competition. Weigh-ins always begin two hours before the scheduled start of the competition for the lifters in a given bodyweight category. Weigh-ins almost always begin exactly
on time and they always end exactly one hour after they begin. Those who arrive after the end of the weigh-in will generally not be permitted to compete, so make sure you arrive early for the event. Sometimes meet directors will permit latecomers to enter the competition as “extra” lifters, but such lifters are not eligible for awards or to score team points.

Athletes must weigh no more than the limit for their bodyweight category, i.e., 85.00 kg. in the 85 kg. category. No allowances are made for those who are overweight other than permitting them to attempt to reduce their bodyweights during the one hour weigh-in period.

At the weigh-in, or before national and some local competitions, the athlete will be assigned a “lot number.” If the number is assigned before the weigh-in, athletes will be weighed in lot number order, with the lowest being weighed first. Even if the number is assigned during the weigh-in, it will be used to determine the order of lifting in some situations which will be discussed later.

For women, the bodyweight categories, in kilograms, or kg., (the approximate equivalent weights, in pounds, are provided in parentheses and are rounded down to the nearest quarter pound) are: 48kg. (105.75), 53 (116.75), 58 (127.75), 63 (138.89), 69 (152), 75 (165.25) and 75+. These numbers are carried to the second decimal point, so 48 is 48.00. For men the categories are 56 (123.25), 62 (136.5), 69 (152), 77 (169.75), 85 (187.25), 94 (207), 105 (231.25) and 105+.

Those who are very close to a category limit, such as a pound or two away may wish to manipulate their diets or fluid intake in the short term to weigh within the limit of a certain category.

Some lifters who are further above the limits for particular categories may want to reduce their bodyweights modestly in order to compete in a nearby lower category where, theoretically, the competition should be weaker. Advanced lifters reduce their bodyweights by as much as 5% or more, but with reductions that large their performances suffer. Reductions of up to 2% generally have little effect on performance and performance changes with between 2 and 5% vary by the lifter. It is generally unwise for beginners to manipulate their bodyweights very much because of the effect on performance and because competition in local events, and even on the national level, may correspond closely to bodyweight categories, as athletes in a lighter bodyweight category often out-lift those in a heavier category.

Modest reductions in body weight can be effected by reductions in food and drink the day before the event; research has shown that reductions immediately before the competition are more effective than reductions that begin many days earlier. More advanced athletes often combine liquid restrictions with saunas or other means by increasing environmental temperature to achieve significant weight loss, but this is a topic for a more advanced course and weight reductions are not be recommended for younger and newer athletes.

Beginners are generally not advised to go to any great lengths to “make weight” by reducing their natural bodyweights to a lower weight necessary to compete in a particular bodyweight class. And making weight (or artificially holding down ones lean bodyweight) is especially discouraged for young athletes, who are in their growth stages of life and need adequate nutrition, unless such athletes are on a diet aimed at reducing their bodyfat, because they are not reasonably lean.

Age Categories

There are at least four separate age categories in around which competitions can be officially organized, but most competitions are simply “open” and no age categories are used in the open division of the competition. In such competitions, special awards in particular age categories may be given, in addition to traditional awards for first, second, and third places. All age groups are calculated in the athlete’s year of birth, so that if an athlete is lifting in 2014 and was born in 1994, he/she is considered twenty years of age for the entire 2014 calendar year. The age categories are:

1. Youth - Up to and including seventeen years of age;
2. Junior - Up to and including twenty years of age;
3. Senior (open to athletes of all ages);
4. Master – 35 years and older, generally broken into 5 year age brackets like 55 to 59.

Note: Youth, Junior, and Master athletes may generally compete in senior level competitions, but not the other way around.
Venue Appraisal

If you have an athlete who is close to the bodyweight limit in a particular bodyweight category, it is useful, upon arriving at the competition, to see if the athlete can check his/her weight. Sometimes a separate “check scale” is provided for this purpose, but in local competitions there is typically only one scale, which may only be available to check weight when an actual weigh-in is not being conducted, if at all. In such cases, you may want to bring your own check scale (which can be compared on-site to the competition scale to determine any difference between the weight registered on each scale). Then that check scale can be used whenever it is required by your athletes.

Upon arriving at the competition, you should familiarize yourself with the location of the warm up room relative to the competition platform. It generally is adjacent, but sometimes can be some distance away. If the warm up area is far away from the competition platform, allowances must be made for the time the athletes will need to get out to the platform from the warm up area, once he/she has been called to the competition platform by the announcer of the competition.

If the athlete uses a focal point while lifting (which is highly advisable), the time to look for it is before the competition begins, or between sessions.

The type of equipment being used in the warm up area and the competition platform should be assessed. Competition equipment specifications are set by a series of detailed rules, and usually, at least, the bars used in the warm up area and those used for the competition will be the same make, but this is not guaranteed. It is never a bad idea to measure the bar on the platform, especially the location of the hand spacing rings relative to the ones on the bars in the warm up room and the ones the athletes typically train on.

Progress of the Competition

Most competitions are divided into “sessions” by gender and bodyweight. At local competitions, multiple bodyweight categories will typically lift simultaneously. All males from 56 to 77, or 85 kg., categories often lift in one session, with the heavier lifters lifting in a second session. Women's sessions, because the number of female competitors is often smaller than the number of male competitors, at least at local competitions, often include women in all bodyweight categories in a single session. But this is all up to the discretion of the meet director and is affected by the number of competitors that are expected and/or actually enter.

You should also familiarize yourself with the way in which the coaches and athletes are kept abreast of the progress of the competition. At local events, this is typically done via a “competitor card” assigned to each athlete and arranged by the announcer, or less frequently by a separate “marshal” assigned to managing the cards in order of the lifting on the competition platform (at national and higher level events, marshals are required). Any changes in weights already requested for a given attempt, or weights selected for new attempts, are reported immediately to the announcer, who records the weights requested on the card, and may ask the athlete/coach to initial the weight requested to certify that the requested weight was recorded accurately (this is required at national and higher level events).

The cards of lifters attempting the lowest weights will be arranged on the announcer's table to come before cards of those lifting the heaviest weights. If two or more athletes are attempting the same weight, first attempts go before second attempts and second attempts before thirds. If the weight and attempt number are the same, the athlete who has taken the biggest increase from his/her prior attempt goes first, and if both lifters took the same weight on the prior attempt, or both are taking a first attempt, the lifter with the lower lot number, a random number assigned to each athlete before or at the weigh-in, lifts first.
Warm-up for the Competition

For most new athletes, it is a good idea to warm up for the snatch, the first lift in the competition, in the same way the athlete warms up in training. Because the snatch is the first lift in the competition, and because athletes are often nervous about that first attempt, it is often a good idea to have the athlete lift the same weight as his/her opening attempt in the warm up room. Many more advanced athletes will warm up to 5 to 10% less than their opening attempts, but even some Olympic Champions warm up to the weight they plan to start with, especially in the snatch. However, most who do this warm up to a lower weight than their starting attempt in the C&J because some of the nervous edge is off after the snatch and because, relatively speaking, executing a clean and jerk is more energy consuming than executing a snatch.

For instance, if a lifter is beginning in the snatch with 60 kg., he/she might have a first warm up with the empty bar, which is 20 kg. for men, then move to 30 kg., 35, 40, 44, 48, 52, 55, 58 and then finish with 60 kg. about 2 to 4 minutes before he is called to the platform for his first attempt, depending on the amount of rest between lifts the lifter typically takes in training. If the lifter in question happens to be the first lifter to start the competition, it is a simple matter to have the warm-ups planned in accordance with the clock. For instance, given the warm up attempts provided above and a lifter who likes three minutes of rest between lifts, the lifter would begin approximately 25 minutes before the competition begins and perform a warm-up set every three minutes so that the last warm up would be completed approximately three minutes before the competition began.

However, your lifter will seldom be the very first lifter in the session and could be one of the last. For instance, let’s assume your athlete was commencing with 100 kg. There are three lifters beginning with 60 kg., two with 70 kg., three with 80 kg., two with 90 kg. and one with 95 kg. In such a case, there would be at least a total of approximately 30 attempts before your lifter started. This might be comprised of three attempts each from the eight lifters that are beginning with between 60 to 85 kg. (a total of 24), three from one of the lifters starting with 90 kg. (90, 94, and 98), two from the other lifter starting at 90 (90 and 95, then 100 jumping to follow your lifter), and one attempt for the lifter starting with 95 (who jumps to 100 for his second attempt).

The average attempt in a Weightlifting competition typically takes something like 1.25 to 1.5 minutes. This timing arises because one minute is permitted for each lifter to make an attempt once his/her name is announced. Before that, it takes time for the loaders to load the bar to the correct weight. In addition, 2 minutes is allotted per attempt to lifters who follow themselves because they repeat a weight after a miss, or they follow themselves because no other lifter is lifting a weight that is between the last attempt and their upcoming attempt. But 1.25-1.5 minutes is only a rough average. For example, you have a lifter starting with 100 kg. and there is one lifter going before him, at 95 kg., it would be simple to assume that your lifter will go in about a minute, but the lifter who is taking 95 kg. before your lifter might miss twice before making the weight, adding two attempts, at two minutes each, to your lifter’s wait. That same lifter might have submitted 95 kg. as an opening attempt, but it felt good during the warm-up, so he/she decided to start with 100 kg. and has a higher lot number than your lifter, so your lifter will now be the first up with that weight.

Consequently, instead of warming their athletes up by estimating minutes to go, coaches generally count the expected number of attempts before the athletes go, by adjusting that count as the competition progresses and adjusting warm-ups accordingly, thus increasing or decreasing the rest period between warm-up attempts as appropriate. If there is an unexpected delay due to an equipment problem or other issue, a few extra warm-ups may have to be added. If a number of lifters take unexpected jumps, or do not use all of their attempts, the tempo of warm-ups may have to be accelerated.
somewhat, or some warm-ups will need to be skipped. That is why constant checking of the competitor cards by the coach is essential.

Once your lifter is called to the platform by the announcer, a countdown clock will be started on your lifter. The countdown begins with 60 seconds and your lifter must begin his/her attempt before the clock reaches zero. Within the first 50 seconds of the countdown, your lifter may change the weight originally requested at the weigh-in up to two times. But once the countdown has reached the last 50 seconds, no changes can be made.

If for some reason the opening attempt is missed, it is generally wise to have the lifter take his second attempt with the same weight. Increasing after a miss is always a risk and generally one that should not be taken by the less experienced lifter and only rarely by the experienced one. If your lifter does repeat, and no other lifter is taking a first or second attempt with the same weight, your lifter will follow himself/herself and will be given 2 minutes on the clock instead of the standard one minute. This is a recognition that your lifter just made an attempt and needs some additional rest.

If the first attempt was a success, the lifter should increase the weight for his/her second attempt in accordance with such factors as how easy the opening attempt was, how the warm ups looked, and how the lifter reports feeling, as well as what was originally planned. The announcer/marshal will automatically record an increase of 1 kg., unless the coach says otherwise. If 1 kg. is entered and the clock is started on that athlete for that weight, once the athlete is called to the platform by the announcer for that weight, the coach has only 30 seconds to “declare” a different weight or, the same weight entered by the announcer. If no declaration is made before 50 seconds have elapsed, the lifter will be required to attempt the automatic increase. If a weight is declared within the first 30 seconds, the lifter can make two weight changes up until the time there are only 50 seconds left on the clock. Once the countdown clock has reached the last 50 seconds, no weight changes can ever be made.

Between the first and second attempts, and the second and third attempts, the coach must count the number of attempts before his lifter is called. The same kind of process is followed as for counting the number of attempts to the first attempt. For instance, if your lifter is only increasing his weight by 5 kg., any lifters taking one or two kg. less than that weight can be assumed to be taking one attempt before your lifter goes, although it could be more if one or more of those lifters misses and repeats. In contrast, if your lifter is jumping 10 kg., there may be lifters starting just above your lifter’s last attempt who will take two or more attempts before your lifter is called to the platform again. Consequently, the coach must check the cards regularly to stay on top of weight changes by other lifters, misses, successes by other lifters, and withdrawals from the competition, because all of these can affect the number of attempts before your lifter goes.

Once the snatch event is over, there is generally a 10 minute break before competition in the clean and jerk begins. But this break can vary in time from meet to meet. The coach must take into account both the break time and the number of lifters who will be performing before his lifter’s first clean and jerk in order to time the warm-ups properly.

The coach should endeavor to maintain a calm demeanor in the warm-up area. Athletes will often be nervous as they warm-up and seeing the coach in a nervous state only makes things worse. Athletes who are overly nervous are prone to skill errors, and beginners, whose skill patterns are not deeply embedded, are particularly subject to technical breakdowns if they become too nervous. In addition, while performing six lifts in competition will rarely tire an athlete, being excited during warm-ups can easily deplete nervous energy and adrenaline before the clean and jerk is completed. So every effort should be made to remain relatively calm while warming-up.

Similarly, some athletes will be able to lift more when they know it means the difference between winning or placing second. But other athletes will not respond well to knowing they “must” make this lift in order to win. Therefore, the effective coach learns which approach is best for each athlete.
Competition Tactics

Competition tactics are a subject that much could be written about, and they will be discussed further in a more advanced course. But some basics are useful to the new coach.

The competition outcome is decided on the basis of the best snatch and best clean and jerk made by each athlete, which are combined into a “total.” The lifter with the highest total in his/her bodyweight category wins that category. If two lifters tie in the total, the lifter with the lighter bodyweight prevails. If two lifters have the same bodyweight and total, the lifter who made the total first is the winner.

Consequently, if another lifter has made a certain total and your lifter wants to win, he/she must either tie, if lighter, or lift at least 1 kg. more, if he/she is the heavier lifter. Generally, the best policy with regard to competition is to have your athlete try to make all of his/her snatches without worrying about what the competition is doing. Once the results of the snatch are known, and a sense of the opening clean and jerks of the competitors is gained, the coach can assess whether a medal is within striking distance and react to competitors as is appropriate. However, it is never a good idea to encourage a newer lifter to extend himself much beyond his/her recent best if such a weight is needed to win or place, because the focus should be on successful attempts as opposed to chasing the competition, especially in early competitions.

Additional Rules of Weightlifting

In addition to the rules already covered in the previous section, it is important for coaches to understand the basic rules of correct lifting. Coaches need to be knowledgeable with the rules well ahead of the competition, so it can be assured that their lifters are doing the lifts correctly in training. It is important to remember that many of the rules were created to protect the athletes, even though they may at first seem arbitrary.

For instance, there is a rule against touching the elbows to the knees or thighs when the lifter is in a squat clean position. There is no real advantage to allowing the elbows to touch these spots, so some coaches wonder why the rule is there. It is at least partially there because touching the elbows to the knees or thighs can lead to a wrist injury. Therefore, it is best to train athletes to keep the elbows well above the knees and thighs for both rule compliance and safety reasons. In the clean, racking the bar below the nipples, raising the bar to a higher position from where it has been racked, and turning the elbows after the rack (the initial contact with the shoulders/chest or arms fully bent) are all prohibited.

The snatch and the clean pulling motion must be executed continuously, with no stopping along the way. Any attempt that reaches the height of the knee is considered a full attempt, whether it goes past that point or not. When the lifter receives the bar on the shoulders or overhead, no part of the body, other than the feet, may touch the platform. The lifter’s feet may not touch the floor outside the perimeter of the 4 x 4 meter lifting platform (it can be 12 x 12 feet in local competition instead).

For all overhead lifts in the snatch or jerk, the bar must go directly and quickly to arms’ length and remain there until a down signal is generated by the referees. Any press out (pushing the bar overhead instead of catching it on straight arms), failure to lock the elbows immediately, or unlocking of the arms after they have been locked will be a cause for disqualification, as will touching the bar to the head. Between the clean and the jerk, any apparent effort to make the jerk that is not completed is counted as an attempt and the lift is over. No grease, oil, talcum powder, water, or similar lubricants can be used on the thighs.

If a lifter incurs a skin cut or abrasion that leads to bleeding, the officials will generally require that the injury be covered to assure that no blood is transferred to the bar where other athletes could be exposed to it. However, no bandages can be applied to the shins, thighs, or arms unless an official approves it for these purposes.

The referees will give an audible and a visible signal when they feel the bar and lifter are motionless and the bar, the feet, and the torso are all parallel. At that point the lifter must lower the bar until it is past the shoulders, after which it may be dropped to the platform.

Rules are somewhat more involved at national and international events, so coaches who are taking athletes to such events are strongly encouraged to became familiar with these rules in order to assure that they are preparing their athletes to comply at such events. It is also important to review the entry blanks carefully. They are published well in advance of all national events on the USAW web-site, to assure that all of the nuances associated with each national event
are understood, because they can vary somewhat from event to event and year to year. Perhaps the most important point to remember in preparation for national events is that they must be entered well in advance and no exceptions are made. National champions have lost the ability to defend their titles because of a failure to make the entry deadline. Therefore, it is crucially important to enter on a timely basis.

Running a Competition

Running a Weightlifting competition is fun for your athletes and for you. Through competitions, you can introduce your athletes to the format of the environment in which they will have to perform throughout their careers. You can have a closed competition, for your athletes only, or you can run an open competition. In the latter case, you open entries to all other lifters or, in rarer cases, to a subset of other lifters of your choosing who are categorized by such factors as age, club, and location. Opening up the competition exposes your lifters to others, which can be a very stimulating experience.

The bare minimum of what you need to run a local competition is relatively simple:

1) A “sanction” from the USAW;
2) An accurate scale for measure the bodyweights of the athletes;
3) A competition platform and warm up platforms;
4) A competition quality barbell set with men’s and women’s bars in kilos with precise weights and several warm up sets with men's and women's bars;
5) At least three referees, an announcer and loaders (the latter to place appropriate weights on the bar during the competition);
6) A timing device that counts down in seconds;
7) Competition documents like entry blanks, competitor cards, and a score sheet (which must have a format provided by the USAW and is available on the USAW web-site).

Sanction - The sanction from the USAW is a prerequisite for making your competition an official one. It is recognized by the USAW, which is the sole governing body for the sport of Weightlifting in the USA. Sanctioning your meet also provides you with liability insurance for the competition. A sanction requires that the athletes competing in the meet be USAW members, but it also assures that the athletes competing in the competition have accident insurance. You can obtain a sanction by filling out an application that can be found at the USAW web-site. You must pay a nominal sanction fee and your sanction application must be signed by your Local Weightlifting Committee (LWC) President. The LWC is the local representative for USA Weightlifting in your area and can help you with things like obtaining referees and other volunteers, and sometimes even equipment that you can use for the competition. The LWC President's signature is required to assure your local officials are aware of your competition and can monitor it if they wish. They are not there to impede the running of your competition, but rather to help assure it is run properly. The USAW national office must receive your application for a sanction at least 2 weeks prior to the competition you wish to conduct.

Scale - In theory, your scale should be certified by local authorities to assure the weights recorded thereon are accurate, and it should weigh the athletes in kilos, accurate to the 100th of a kilo. But for local competitions, an accurate scale that weighs in pounds can be used, as long as the pound limits of the bodyweight categories, provided earlier, are observed when placing athletes in the proper bodyweight category.

Platform - If you have a club where your athletes train. Your training platforms can serve as warm-up platforms, so you only need a 12’X12’ competition platform (it must be 4 x 4 meters if you want to comply with national/international level rules). This can easily be constructed by using 9 sheets of flat ¾” plywood; see the USAW web-site for more details.

Barbells – To conduct a competition, you need a barbell that meets competition requirements in terms of the dimensions of the bars and weights and provides weights in the proper kg. increments. You must have at least two pairs of 25 kg. plates, and two each of the following plates of, 20, 15, 10, 5, 2.5, 2, 1.5, 1 and .5, plus collars that weigh 2.5 kg. each. Collars are used for all attempts in competitions. The 25 kg. plates are placed on the bar as soon as the bar reaches 75 kg.
(70 kg. when the women’s bar is being used). Then, every time an additional 50 kg. is added, two more 25 kg. plates are placed on the bar (e.g., at 125, 175 and 225 kg for the men and at 120 and 170 kg for the women).

Ideally, you should have warm-up weights that meet the same standards as competition plates (e.g., be accurate and be in kilos (kg.)), but for closed competitions weights that are calibrated in pounds can be used if athletes and coaches know how to convert pounds to kilos, so that the relation between warm-up weights and what will be attempted in the competition is clear. For open competitions, athletes will expect kilos in the warm-up area.

**Officials and Loaders** – You will need, at a minimum, three referees to judge the lifts the athletes perform, and an announcer to announce the lifters appearing on the competition platform and assure that the order of the competition is maintained. You will also need loaders who will load the competition barbell to the weight called for by the announcer.

**Timing Device** – Since athletes are given one or two minutes to make their attempts after their names have been called, some kind of timing device to count down the one or two minutes by seconds is required. Ideally, this is a competition clock owned by many LWCs or larger clubs, which visibly counts down the seconds and sounds a buzzer at 90 seconds (when a lifter has two minutes to begin the lift) and at 30 seconds for all lifts. At local competitions, if such a clock is not available, a stopwatch that counts down, or even a wrist watch, can be used, as long as audible signals are provided to the lifter as noted above and at increments of 10 to 15 seconds.

**Documents** – Competitor cards, which have already been discussed, are needed to maintain the order of the competition. A score-sheet is required in order to record the results of the competition and report the results to the USAW, which is required for all competitions. Finally, an entry blank is required so that all athletes can understand the rules particular to that competition (e.g., open or age divisions, closed or open, weigh-in times, awards that will be given) and officially enter the competition and agree to a liability waiver for you, your facility, the officials, and the USAW.
B. Some Basic Biomechanics

Some “Whys” of Weightlifting Technique - Basic Mechanics and Biomechanics

Weightlifting coaches and athletes need not be experts in the laws of mechanics and biomechanics in order to be effective and to teach and learn good weightlifting technique. But a very basic understanding of some mechanical principles can be very helpful for understanding the why of technique, and a more in depth understanding of these laws will certainly be helpful, but is well beyond the scope of this course.

Newton’s Laws

More than 300 years ago, Isaac Newton revolutionized physics by identifying three laws of mechanics that underlie all motion we observe in the world, including the weightlifting world. All three of these laws are of crucial importance to weightlifting, but the first two are nearly self-evident, even to those who have never studied physics. Informally expressed, the first law states that a body in motion (or at rest) stays in motion (or at rest) unless it is acted upon by a force that changes that motion, such as gravity pulling an object like a barbell back to the ground. The second law says that the greater and longer a force is applied to an object, the faster it accelerates and the greater its velocity becomes.

The third law is a little less obvious but no less important and it has perhaps the widest range of applications to weightlifting technique. It states for every action there is an equal and opposite reaction. In practical weightlifting terms, this means that when an athlete moves one part of his/her body in a certain direction, the rest of the body tends to move in an opposite direction. For example, if an athlete exerts a force against the barbell or floor, the barbell or floor exerts an equal and opposite force against the athlete.

An example of the third law would be a situation in which a lifter throws his/her head and shoulders back at the top of the explosion in the pull. Such an action would tend to throw the lifter’s hips forward, and, especially if the bar was in contact with the hips at this point, to throw the bar forward. Similarly, if the elbows are raised rapidly as a lifter moves under a clean, the rest of the lifter’s body is propelled downward under the bar. Finally if, after driving upwards with the hips, the lifter pushes up on the bar with the arms to lock out a heavy snatch or jerk, the body will be pushed down under the bar more rapidly than if the hips simply dropped.

Center of Gravity and Combined Center of Gravity (indicated by an X in the illustrations below)

In order to apply the laws of physics to objects such as a human body and a barbell, a point at which the mass of such objects is balanced must be defined. This is referred to as the center of gravity (COG). This is a point at which an object is balanced in all directions (it would have no tendency to rotate in any direction if it were suspended at that point). In a barbell that is equally loaded on both sides, the COG is the exact center of the bar from side to side, top to bottom, to front and back. All other things being equal, the closer an object’s COG is to the ground, the more stable that object is (the less likely it is to tip over).

For the human body standing at attention, the COG is approximately at the level of the navel (but in the middle of the body front to back, rather than at the front of the body, as the navel is). However, if a human raises his arms overhead, the COG moves upward somewhat from the navel, because the arms have distributed more of the weight of the body at a higher level than when the person is standing at attention with the arms down.

When a lifter applies force to a barbell, the lifter’s body and the barbell act as one and a combined COG (CCOG) emerges somewhere on a straight line drawn between the COGs of the lifter and barbell. If the lifter and the barbell have the same weight, the CCOG is exactly in the center of the line. This combined center of gravity moves more toward the barbell than the body when the barbell grows heavier in relation to the body, and more toward the body as the barbell grows lighter in relation to the body.
Base of Support

The COG concept becomes more meaningful when it is combined with the concept of the base of support, which is essentially the perimeter of where any object contacts the ground. In the case of a weightlifter with his/her feet in line horizontally, from side to side, the base of support is the area between the athlete's toes and heels from front to back, and between the outside of the athlete's feet from side to side. In a split position, the base of support is between the front of the toes of the front foot and the rear of the ball of the foot of the back foot (assuming the lifter's rear leg is supported on the ball and toe of the back foot), from front to back. From side to side, the base of support runs from the outside of the lifter's rear foot and the outside of the lifter's front foot (assuming the feet are not crossed over from side to side).

If an object is tilted from a purely vertical position, as soon as its COG moves outside the perimeter of the object's contact with the ground, the object will tip over. For example, when a 4” by 4” square block is lying flat on the floor, its center of gravity is 2” above the floor, 2” from front to back and 2” from side to side. The base of support of the block is a 4” square traced around the point where the block contacts the floor. If the center of the block is now tilted from front to back by more than 2”, the block will fall forward, but if the center of the block is tilted forward by less than 2”, it will fall back to its original position.

For weightlifting purposes, the concepts of the COG and base of support have at least two important implications. First, the lower the barbell when it is overhead, the less likely it is for the barbell to travel outside the base of support. Second, should the combined COG of the barbell and lifter travel outside the base of support (the outer edges of the feet), say at the top of the explosion in the snatch or jerk, the lifter will tend to topple over, necessitating a jump or split backward or forward, or taking a quick step, in order to control the bar overhead. This is much more difficult to accomplish than to simply maintain the barbell during its upward motion over the lifter’s base of support.

Leverage

A lever is comprised of a rigid object or bar (lever arm) that rotates around a support (fulcrum), transmitting and modifying two forces that are applied to different points on the lever. In the body, our joints supply fulcrums, our bones supply lever arms, and our muscles supply the force needed to move our bones and whatever may be attached to them (the resistance). In most cases, our muscles are applying force to the bones at a point closer to the joint or fulcrum than the resistance we are trying to move.

For instance, if one holds a 10 lb. bar in ones hands and extends the arms straight in front of the body, until the arms are parallel to the floor, the shoulder muscles act to support the arms at a point very close to the shoulder joint or fulcrum, and the resistance supplied by the bar and arms themselves is much further away from the fulcrum. Ignoring the weight of the arms themselves for the sake of simplicity, if the bar is 10” from the shoulder joint, but the muscles of the shoulder attach to the shoulder 1” from the joint, the bar is 10 times further from the shoulder joint than the point at which the shoulder muscles apply force to the arm. The laws of mechanics tell us that, in such a case, the muscles of the shoulders will have to provide 10 times the force provided by the resistance in order to lift that resistance. Therefore, the shoulder muscles will need to apply 100 lb. of force to the arms in order to support the 10 lb. bar. In contrast, if the bar was raised upward to the point where the horizontal distance between the bar and the shoulder joint was 4”, and the point at which the shoulder muscles attached to the arm was .8” from the shoulder joint, the difference in the distance between the bar and the muscle attachment would only be fivefold (.8x5 = 4.0), so the force needed to move the bar would be only 50 lb. And if the bar was directly above the shoulders, the difference in leverage between the shoulder muscles and the bar would be nearly zero, so the effort required to hold the bar overhead would be minimal (which is one of the reasons that good weightlifting technique involves supporting the bar directly above the shoulders when the bar is overhead).

Similarly, when a person is standing and holding a bar in his/her hands, the bar provides the resistance. If the torso inclines forward, the torso acts as a lever arm and the hip joints as fulcrums. The muscles that extend the hips (straighten the torso) supply force to lift the bar that hangs from the lifter's hands. The further the barbell is from the fulcrum (the hips), the harder the muscles that extend the hips will have to work in order to straighten the torso. Therefore, if the bar is close to the lifter's legs when the lifter tries to straighten the torso, it will be easier for the lifter to straighten the torso than it would be if the bar were further away from the legs.

Applying Force From the Center of the Body Outward

Another biomechanical principle that affects weightlifting and other sports is that when force is applied to accelerate an object like a barbell, it should always be applied sequentially outward with the hips at the center. For instance, in the pull, the lifter generates force at the hips with the leg, hip, and back muscles, followed by the trapezius muscles, followed
by the arms pulling the lifter down. This sequencing from the center out, or roughly from the large to small muscles in succession, assures the most efficient use of the athlete’s body to generate explosive forces.

Minimizing the Times When Upward Force Against the Bar Ceases and Maximizing Force Throughout When Force is Applied

One final principal of mechanics bears mentioning. Once force ceases to be applied against the bar, which can happen when a lifter begins to move under the bar after finishing the pull or jerk drive, the bar will begin to accelerate downwards (stop moving upward and eventually fall back toward the platform). Once this happens, in the absence of any intervention by the lifter, the bar will fall just as fast as the lifter can descend under the bar, because the two objects being pulled down by gravity accelerate at the same rate. This means that a lifter in a free fall can never go down any faster than the bar. This phenomenon argues for careful timing of lifting, i.e., the lifter must begin to move under the bar before the upward momentum it has enjoyed dissipates and the bar begins to fall.

Fortunately, there are several means for the lifter to mitigate the free fall rule explained above. First, as was alluded to earlier in the discussion of technique, the lifter must pull himself/herself under the bar in the snatch and clean using the trapezius muscles and then the arms by essentially using force applied against the bar as a reaction surface to allow the lifter to force the body to travel down at a faster rate than gravity alone causes (applying an upward force against the bar also mitigates its fall). This principle combines Newton’s second and third laws of motion. In the jerk, the analogous movement is to drive the body down by pushing up with the arms. The snatch offers this opportunity as well, as the athlete pushes up against the bar with the arms and hands while the bar is brought to arm’s length.

A related approach is to minimize the duration of lack of forceful contact against the platform with the feet. That means the feet are moved from the pulling/driving to receiving positions as quickly as possible and that they move upward from the platform at the end of the pull/drive only enough to slide or skip to their receiving position. They should not come well off the ground or remain off the ground. Air time is wasted time in weightlifting.

Finally, when an athlete applies force to the barbell (such as when the athlete drives upward with the legs during the explosion phase of the snatch, clean, or jerk) any absorbing of that force by a body part that links the force to the barbell degrades the throughput of that force. So if the arms are bent when the legs begin to drive, some of the forces generated by the legs will be absorbed by the straightening of the arms. Similarly, if the torso sags as the athlete goes through the explosion phase, or as the athlete drives out of the bottom of a squat, some of the force generated by the legs will be absorbed by the torso instead of its being transmitted to the barbell. This results in a terrible waste of force. This is another reason why the universal posture must be maintained during all lifting and arms must not be bent during the explosion phase of the pull.

Summary of Biomechanical Implications

To sum up the concepts of action and reaction, the COG, the base of support, maintaining efficient links, minimizing unsupported time and leverage, all support the notion of the lifter’s keeping the bar as close to the body as possible, moving as vertically as possible and moving as quickly as possible throughout the lifting effort. Good technique accomplishes all of this by minimizing horizontal movement of the combined COG of the body and the bar and employing efficient movement patterns.
Some Resources for Further Study

Further Information on Weightlifting Training and Technique:

Sportivny Press of Livonia, MI offers a number of translations of texts produced in the USSR during their peak of dominance in world weightlifting. A few of these are:


Mevedyev, Alexsei – A System of Multi-year Training in Weightlifting.


For some versions of a Bulgarian approach to training, some examples are:

Gjurkow, Dimitar – Annual Competition and Training Program for Senior Weightlifters, pgs. 103-115, Proceedings of the Weightlifting Symposium 1993 Ancient Olympic/Greece published by the IWF.

Terkileri, Yarzan Enver – Naim Suleymanoglu The Pocket Hercules, translated by Erdogan Gulari.

Further Information on Long Term Athlete Development (LTAD):

Istvan Balyi has done considerable work in Canada regarding LTAD. His paper on this subject, written in 2005 has become the foundation for Canadian efforts in this area and can be found at the web-site:


The Canadian Weightlifting Federation (CWFHC) has produced a document that provides a broad overview of LTAD. The document can be found at the following web-site:
