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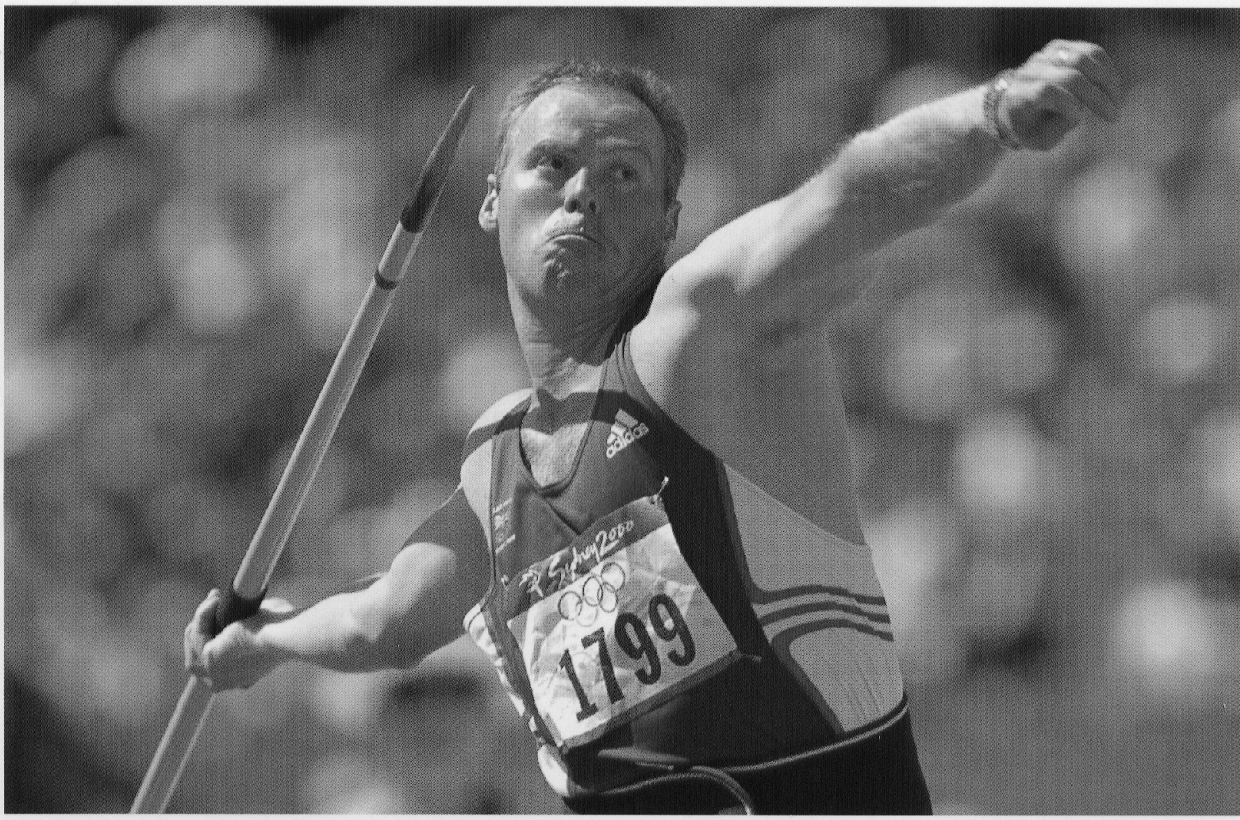

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Chapter 25

Training for Weightlifting

JOHN GARHAMMER AND BOB TAKANO

Introduction

Since 1972 two overhead lifts have been contested in the sport of weightlifting, the snatch and the clean and jerk. The sport is often referred to as Olympic (style) weightlifting since it is contested in the Olympic Games. In the snatch lift, the barbell is lifted in one continuous motion from the competition platform to arms' length overhead. The athlete catches the barbell overhead in a deep squat position, and then stands with the barbell in control until a 'down' signal is received from the officials (Fig. 25.1).

The 'clean' phase of the clean and jerk lift is similar to the snatch except that the barbell is first lifted to the shoulders rather than overhead, and a narrower hand spacing is used on the bar. When the athlete stands from the squat position to finish the clean lift he or she must then 'jerk' the barbell overhead to complete this two-part lift. The jerk is performed starting with the barbell held firmly on the shoulders. The knee and hip joints are then slightly flexed and then rapidly extended in a jumping action (rising onto the balls of the feet) to thrust the barbell upward. The lifter then either splits the feet forward and backward, or again quickly flexes the knee and hip joints, to lower the body and catch the barbell at arms' length overhead. The feet are then brought together and the legs straightened to hold the barbell under control overhead until the 'down' signal is given by the officials (Fig. 25.2). The above three lifting movements are performed very rapidly, with the major lifting forces applied to the bar for about 0.8 s in the snatch and clean, and about 0.2 s in the jerk.

The training programmes followed by athletes who compete in weightlifting are based primarily on three principles: specificity of exercise, overload, and variability. Specificity implies the use of training lifts similar to the competitive lifts, performed for a low number of repetitions with near-maximal loads, since in competition the goal is to lift the heaviest weight possible in the snatch and clean and jerk for one repetition. Overload relates to lifting heavier and/or more total weight in workouts than a given athlete is accustomed to. Variability relates to changes and variety in the composition of the training programme in order to avoid physiological and psychological maladaptation problems commonly referred to as 'overtraining' (Stone *et al.* 1990). As the following discussion emphasizes, the variability principle leads to some training programme designs that seem to violate the principles of specificity and overload. Before proceeding with a more detailed presentation of training methods for weightlifting, it must be stated that details of training programme design and content may vary considerably based on: (i) the ability level and years of training and competition experience of a given athlete; (ii) whether or not the athlete can train full time due to employment or educational responsibilities; and (iii) the supervising coach's training philosophy. Many national-level athletes in the USA cannot train as professionals

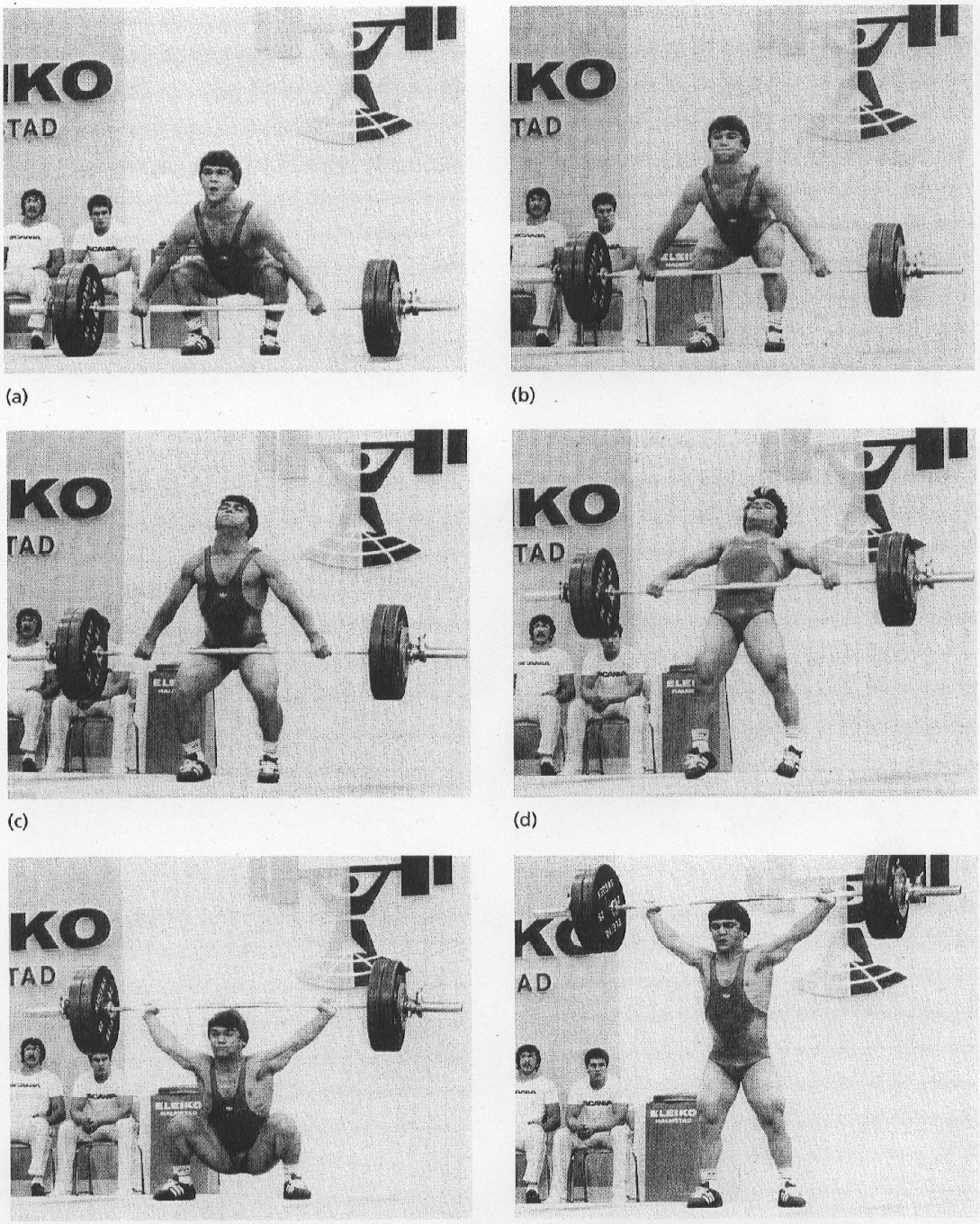
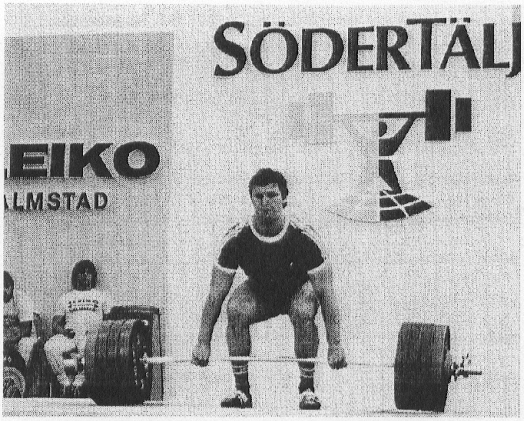


Fig. 25.1 The snatch lift. (a) Start position; (b) end of first pull; (c) start of second pull (power position) after transition from the first pull (note rebending of knees); (d) end of second pull (jump phase); (e) catch position; (f) finish of the lift. (Courtesy of B. Klemens Photos.)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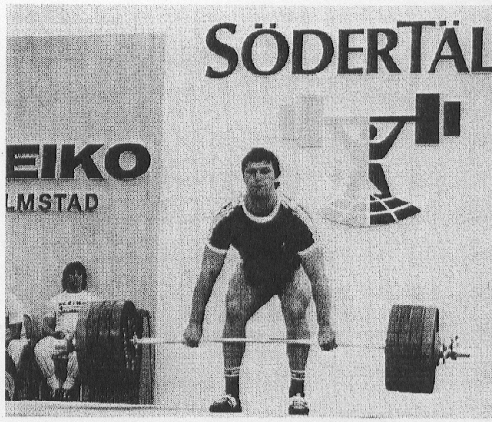
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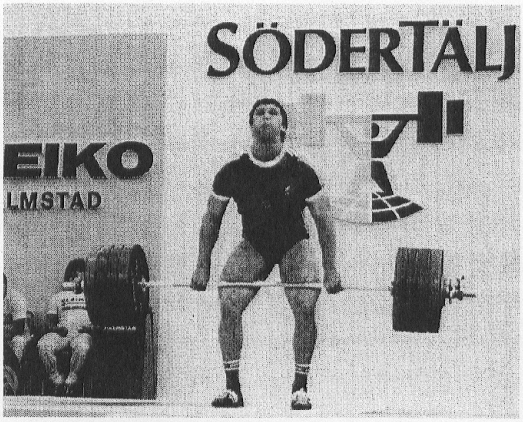
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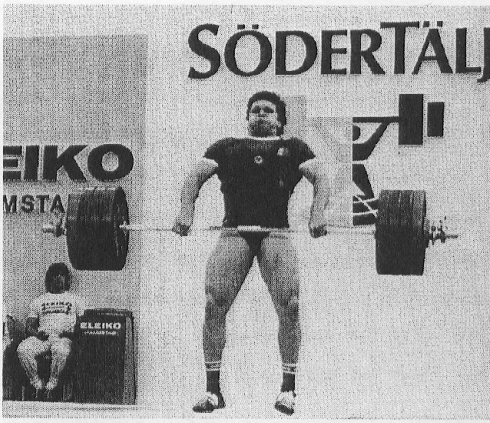
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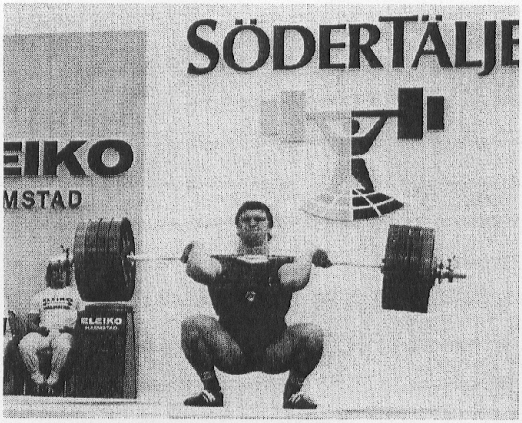
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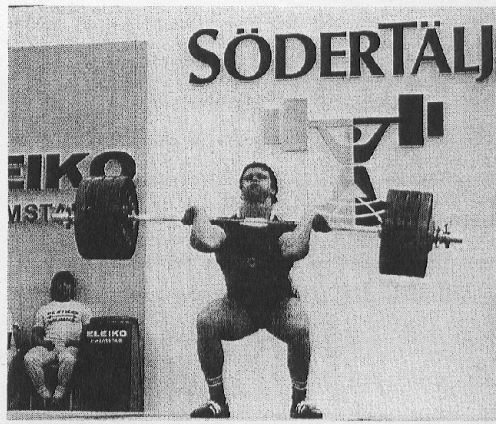
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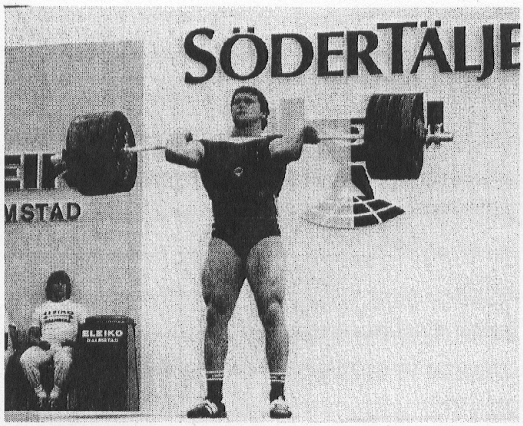

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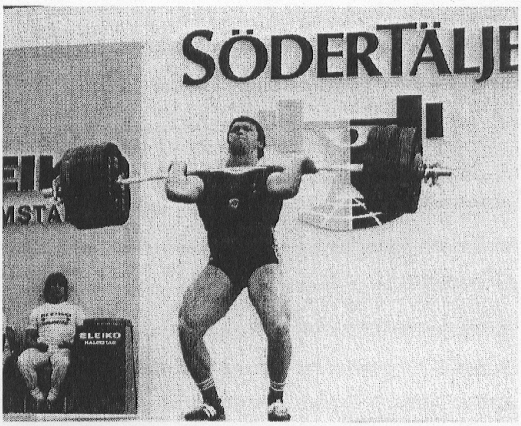

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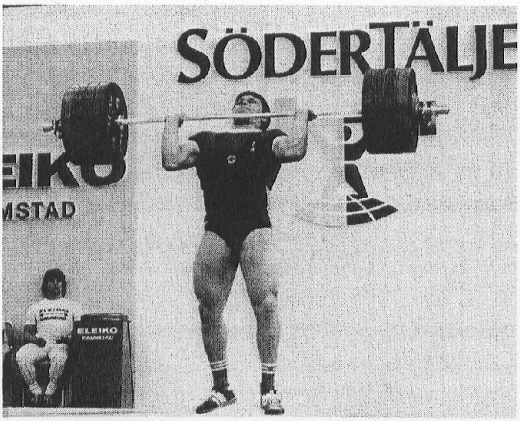

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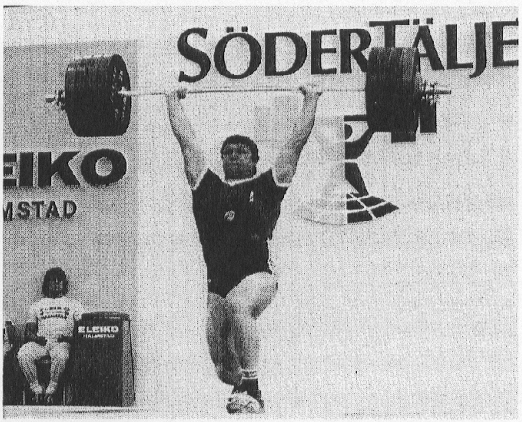

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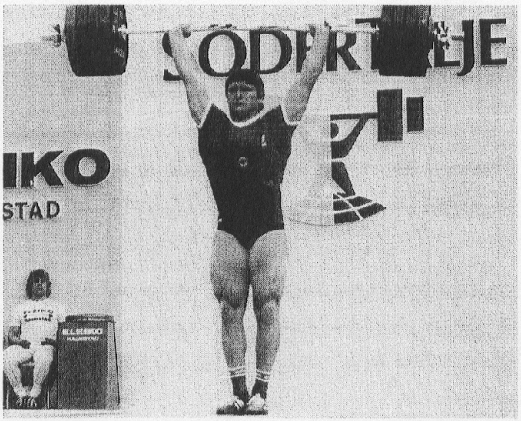

(k)

Fig. 25.2 The clean and jerk lift. (a) Start ('lift-off'); (b) middle of first pull; (c) near the start of the second pull; (d) end of the second pull (jump phase); (e) catch position; (f) standing from the catch position (front squat movement); (g) start position for the jerk; (h) bottom of the 'dip' prior to the upward thrust; (i) end of the thrust phase (jump) of the jerk; (j) 'split' catch position; (k) finish of the lift. (Courtesy of B. Klemens Photos.)

and must adjust their programme accordingly. Examples of such programmes have been published (Jones 1993; Drechsler 1998). The remainder of this chapter will relate primarily to elite-level weightlifters who have trained for the sport for 3 or more years and who compete at the national and international level. Since the initial publication of this chapter in 1992, considerable additional information about the training of elite weightlifters, including female athletes, has been published in the form of books, articles and interviews. Of particular interest are articles contained in the proceedings of the weightlifting symposia held in Ancient Olympia, Greece in 1993 and 1997, and published by the International Weightlifting Federation (IWF), Budapest. Some individual articles from these symposia will be referenced later in this chapter.

Variability as the key training principle

If specificity and overload were dominant and/or exclusive principles of training, the design of a weightlifter's exercise programme would be fairly simple: (i) perform the competitive lifts in low repetitions with maximal weights; and (ii) add a few 'assistance' exercises to emphasize and improve physical qualities associated with proper execution of the competitive lifts, such as speed, strength and flexibility. Practical experience, however, shows that such a plan fails if followed for any prolonged period of time (several days to several weeks). The reason for failure of such an approach to training is summarized by the term 'overtraining'. Overtraining can involve psychological factors, such as loss of motivation, and/or physiological factors related to muscle fatigue or injury, as well as neural and hormonal changes (Nilsson 1986; Kuipers & Keizer 1988; Stone *et al.* 1990). Sale (1988) and Enoka (1988) have discussed the importance of neural adaptations for increases in strength, particularly in the early stages of a resistance training programme.

Kraemer (1988, 2000) has reviewed the responses of the endocrine system to resistive exercise and has pointed out the conflicting research results, likely due to variables such as exercise volume (total number of lifts performed) and intensity (average weight lifted relative to maximum possible), rest intervals and training status of subjects. As discussed below, Häkkinen and colleagues have performed considerable research on the neural and hormonal responses that occur in elite weightlifters during typical training programmes. In studies of 1–2 years' duration Häkkinen *et al.* (1987, 1988a) found that increases in performance correlated to increases in leg extensor isometric force and integrated electromyogram (IEMG) activity (neural activation levels), serum testosterone levels and anabolic/catabolic (A/C) hormone ratios (endocrine responses). Short-duration studies (Häkkinen *et al.* 1988b, 1988c) showed that such responses were sensitive to acute intense workout sessions, with IEMG activity and leg extensor isometric force decreasing. Testosterone was found to increase during the second workout session in one day but decreased gradually after several days of intense workouts. A single rest day was sufficient to reverse this trend. Results of such research indicate the importance of neural adaptations, even in experienced strength and power athletes, and that neural fatigue (decreased IEMG levels) does occur with intense exercise. Also, endocrine responses could be monitored in elite strength and power athletes during important training periods in order to adjust training intensity to optimal levels, that is, without causing decreases in serum testo-sterone levels and A/C ratios which likely relate to reduced adaptability levels and the possibility of overtraining. An additional article (Häkkinen *et al.* 1990) suggests that these conclusions are applicable for both male and female athletes. Thus, variability in well designed training programmes for weightlifters can reduce the possibility of overtraining while maintaining reasonable, if not optimal, progress for the athlete. This is possible via periodic oscillations in overload, meaning planned underload or 'unload' training sessions and training weeks, and strategically placed rest days.

Variability vs. biomechanical specificity

A variety of lifting exercises, beyond the competition lifts, are regularly used in the training programme of weightlifters (for an extensive discussion of them see Vorobyev 1978). This permits not only emphasis on the development of various physical qualities needed to execute the competition lifts optimally, such as strength, speed and flexibility, but also a biomechanical variation which may help avoid overtraining symptoms caused by movement pattern monotony. The weightlifting coach, however, needs to be aware of how the movement properties of a given 'assistance' exercise differ from those of the actual competition lifts. That is, how do the applied force pattern, bar movement velocity and trajectory profile, range of motion of involved body joints and mechanical power output of the exercise relate to the physical qualities that are to be developed by the exercise? Also, how do these factors change as the weight of the barbell changes? In a review article Garhammer (1989) points out that several sport scientists have published data indicating that as barbell weight increases the height to which it is lifted, maximal vertical bar velocity, peak applied vertical force and/or power output decrease (e.g. Häkkinen *et al.* 1984; Garhammer 1985; Garhammer & Gregor 1979, 1992). Thus, for example, an athlete who needs to be faster should emphasize lower-intensity lifts (70–85%) while one who needs to improve strength should emphasize higher-intensity lifts (85 + %). For a given weight, the same trends in the above parameters have been noted for later repetitions in a multiple repetition sequence (set) (Häkkinen 1988). Numerous reports have been published comparing the biomechanical properties of various assistance exercises with the competition lifts; for example, for snatch-related exercises: Häkkinen (1988), Häkkinen and Kauhanen (1986) and Frolov *et al.* (1977); for clean-related exercises: Häkkinen and Kauhanen (1986) and Medvedjev *et al.* (1981); and for jerk-related exercises: Medvedjev *et al.* (1982). The most common snatch-related assistance exercises are: (i) power snatch—very similar to the competition snatch lift but caught overhead with only slight knee and hip flexion rather than in a deep squat position; (ii) snatch pull—similar to the competition snatch lift but the barbell is only pulled to the height of the abdominal to chest area and no attempt is made to catch the weight overhead; (iii) snatch or snatch pull from the hang—initial barbell position is not on the floor but rather held just above the floor to just above the knees; and (iv) snatch or snatch pull from blocks—initial barbell position is above the floor resting on blocks, usually positioning the bar at about knee height. It is difficult to make general statements about the results of biomechanical comparisons between these assistance exercises and the competition lifts due to the dependence of measured parameters on the weight of the barbell used in any given exercise. However, some specific cases can be discussed. The maximal weight that can be used in the power snatch by a given athlete is about 80% of the weight of that athlete's maximal competition snatch lift. With this load the barbell will be pulled higher, reach a greater maximum vertical velocity, result in a greater peak applied vertical propulsion force, elicit slightly different IEMG activity from leg extensor muscles, include a higher peak knee angular velocity and greater range of motion at the knee, and result in greater mechanical power output when compared to the competition snatch lift. Power snatches are therefore a useful assistance exercise for an athlete who needs to improve speed of movement and speed–strength (power).

Conversely, a snatch pull from the floor may be performed with 5–10% above an athlete's maximum competition snatch weight. With a load on the barbell equal to or greater than the maximum competition snatch, it will be pulled to a lower height, reach a lesser maximum vertical velocity, result in a smaller peak applied vertical propulsion force, elicit slightly different IEMG activity from leg extensor muscles, and result in lower mechanical power output when compared to the competition snatch lift. Snatch pulls are therefore useful for an athlete who needs to

improve strength in the snatch movement pattern. Biomechanical characteristics of snatch assistance exercises from the hang or from blocks depend on the exact starting position of the bar, such as above or below knee level, as well as on load. In general, if the starting position is above knee level the exercise will emphasize the development of speed–strength in the final phase of the snatch pull (upper or top pull). If the starting position is closer to the floor the biomechanical characteristics will be more similar to the snatch pull from the floor. Essentially identical statements to those for the snatch assistance exercises can be made regarding the clean assistance exercises; namely, the power clean, clean pull, and clean or clean pulls from the hang or from boxes.

The primary assistance exercises for improving the jerk are: (i) jerk—weight taken from supports rather than cleaned from the floor; (ii) jerk from behind the neck (taken from supports); (iii) push or power jerk—barbell thrust upward as in the competition jerk but caught overhead with only slight flexion at the knees and hips; and (iv) half-jerk—barbell is thrust upward as in the competition jerk but only to approximately head height; it then falls back to the athlete's shoulders. Medvedjev *et al.*'s work (1982) indicates that the most important variables related to success in the jerk are the maximum force generated against the ground, time interval to reach maximum force, and the time interval for 'breaking' or stopping the initial decent phase of the movement. The jerk and jerk from behind the neck were determined to be most effective in perfecting jerk technique, while the half-jerk and depth (drop) jumps were best for developing speed–strength. It was also recommended that no more than five to seven jerks be performed per workout with 90% or more of the maximum jerk (the higher the lifter's classification the lower the number of heavy jerks).

General concepts in the training plan for weightlifters

The above discussion presented information that can be helpful to a weightlifting coach when making specific decisions about the content of a training plan. Before detailed examples of actual training programmes used by weightlifters can be presented a few general concepts in training theory need to be explained.

Matveyev (1972) presented the basic ideas of periodized training programmes. A programme is periodized when it is divided into phases, each of which has primary and secondary goals. In his original model Matveyev suggested the initial phase of a strength–power programme (preparation phase) contain a high volume (many repetitions) with lower intensity (low average weight lifted relative to maximum possible in each movement). As weeks pass the volume decreases and intensity increases. The resulting higher intensity and lower volume represent the characteristics of a competitive phase of training, which leads up to an actual competition.

Typical high-volume (preparatory) phases for weightlifters contain more training sessions per week (6–15), more exercises per workout session (3–6), more sets per exercise (4–8), and more repetitions per set (4–6). Typical high-intensity (competition) phases for weightlifters contain fewer training sessions per week (5–12), fewer exercises per workout session (1–4), fewer sets per exercise (3–5), and fewer repetitions per set (1–3). The duration of each phase may be several weeks to several months in length. Two or more complete cycles (preparatory + competition) may fit into a training year. Stone *et al.* (1981) have proposed and successfully tested a periodized model of strength–power training with sequential phases that change rather drastically. For example, a phase to increase muscle size (5 sets of 10 repetitions in squat and pulling exercises), a phase to improve basic strength (3–5 sets of 5 repetitions), a phase to improve speed–strength (3–5 sets of 3 repetitions), and a phase to 'peak' for competition (1–3 sets of 1–3 repetitions). The use of 10 repetitions per set is higher than typically recommended in the early preparation phase but has proved to be successful in a number of studies (e.g. Stone *et al.* 1982).

The training programme for a weightlifter is generally planned in terms of a training year.

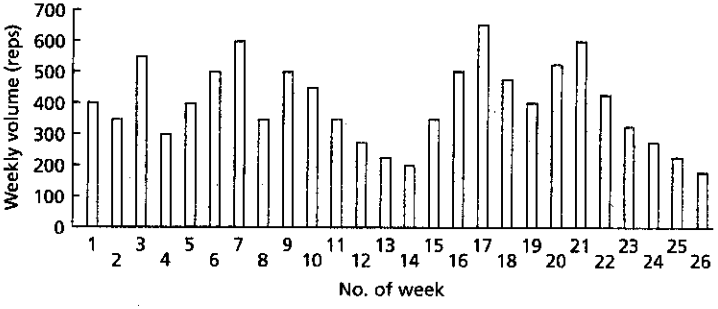

Fig. 25.3 Weekly training volume in repetitions for the first 26 weeks of a 52-week training year for an elite weightlifter. Total volume shown is 10 500 repetitions.

Modifications are made as the actual training year progresses based on specific observed needs of an athlete. The plan begins with a judgement as to how many total lifts (counting all major exercises) should be performed during the year. As an example, 20 000 is a reasonable number for an elite athlete. This total yearly 'volume' is then divided unequally into 12 4-week training months, some of which will be more than double the volume of other months. Each training month then has its volume divided unequally into four weekly volumes. The highest-volume week in a given month may have more than twice the lifts of the lowest-volume week. Each week then has its volume divided amongst an appropriate number of training sessions such that no session has an unreasonably large or small number of lifts. Multiple workout sessions per day are now common among elite weightlifters. A lifter may work out 5 or 6 days per week, with one to three sessions per day common. Each session must then be assigned specific lifting exercises based on the particular athlete's strengths and weaknesses. This approach to training programme development provides for extensive variation, which can stimulate progress while minimizing the chances of overtraining. Details related to the above overview of training plan development are discussed by Vorobyev (1978).

Figure 25.3 illustrates one possible division of repetitions for the first 6 months (26 weeks) of a training year based on a yearly volume of 20 000 repetitions. These 26 weeks contain two complete macrocycles (weeks 1–14 and 15–26), each composed of a preparation phase (10- and 8-week mesocycles) and a competition phase (4-week mesocycle each). It can be seen that in both macrocycles the preparation phase includes much higher volume than does the following competition phase. Also, the second macrocycle contains fewer total repetitions than the first. Competitions occur at the end of weeks 14 and 26. The second 6 months of this training year would follow a similar pattern but with fewer total repetitions (9500 vs. 10 500). This type of weekly (microcycle) training volume variation is typical for elite weightlifters. The following section describes examples of training weeks during preparatory and competition phases that are representative of two different national programme philosophies.

Training methods

Most of the world's weightlifting training programmes are variations of the models established by the weightlifting federations of Bulgaria and the former Soviet Union, the top two programmes in the sport for much of the three decades of the biathlon. In recent years both nations have allowed foreign coaches and athletes to participate in their training programmes, thus making this information available to students of the sport. These two programmes and their philosophies were strongly affected by geopolitical factors.

The former Soviet Union benefited from the diversity of human types that inhabited the vast geopolitical complex. The geographical

distances between training centres created problems that inhibited strict monitoring of training, and allowed for a greater degree of variation from the established national philosophies. This also inhibited the frequency of collective training by national team members. During the final decade of the Soviet Union there was some discontinuity in the development of a standardized training methodology as the position of national coach, a largely administrative office, was filled by four different coaches. With the breakdown of the Union into 15 separate republics, each with different economic and funding problems, many coaches have continued developing weightlifters using the methods that correspond closely with the old Soviet programme.

The Bulgarian programme involves a smaller number of carefully selected athletes occupying a much smaller geographical area than the Soviet Union. The nearly 30-year term of service of national coach Ivan Abadjiev provided great continuity with little opportunity for variation. The relatively small size of the country allows the national junior and senior teams to train collectively for a majority of the time under strict oversight from Coach Abadjiev. Several smaller countries that have recently excelled in weightlifting at the world level, such as Greece, Turkey and Iran, follow training concepts that can be traced to the Bulgarian system.

The above two programmes differed philosophically in the longevity expected of the careers of their top performers. The Bulgarians expect an athlete to mature quickly, produce high results at a single Olympics and then, in all probability, to be replaced before the next renewal of the Games. Hence, double Olympic gold medallists are rare. The Soviets expected a lengthier career from their top performers.

Both programmes are designed to train talented athletes with no serious limitations in joint mobility. The technique learned by the athlete during the first year of training is not altered significantly, except to account for increases in body weight. The larger battery of exercises employed during the earlier developmental years of training should minimize any imbalances in the development of musculoskeletal anatomy. Those athletes involved in these training programmes must be in sufficiently fit condition to endure the stresses generated. An individual returning from injury rehabilitation or any other lay-off should employ a more diversified, less intense regimen before undertaking elite-level training.

The *K*-value is a derived parameter that is used to monitor the intensity of training programmes. The *K*-value can be defined as the average weight lifted per repetition in a complete training cycle divided by the two-lift total performed at the end of the competition phase. Empirical results indicate that the optimal range of average weight lifted per repetition lies between 38 and 42% of the competitive total (Takano 1990).

Restoration is a necessity for an athlete to train in these types of regimens. Jacuzzi, steam baths, sauna or massage must be employed and cycled several times weekly. Nutritional supplementation is also required.

Bulgarian training

The Bulgarian training approach is unique in that it does not deal with percentages of maximum or expected maximum lifts, a procedure common to weightlifting training for at least the last four decades. The battery of primary exercises is limited to only six (snatch, clean and jerk, power snatch, power clean and jerk, front squat and back squat). Training sessions are limited to 45-min periods. This time limit is to ensure that athletes are training only during the period during which the body can maintain elevated blood testosterone levels (Abadjiev 1989). Two 45-min sessions are combined into a complex around a 30-min rest period during which testosterone levels can be restored.

To begin a snatch complex (Table 25.1), the athlete warms up with snatch singles towards a weight near the maximum expected for that day. If the first lift is successful, more weight is added. This procedure is continued through the six attempts. As an alternative, the athlete may take singles at 15, 10 or 5 kg below maximum between

Table 25.1 Bulgarian preparation week.

Monday	
Morning	
Session 1	Snatch—singles to 6 maximum efforts Rest 30 min
Session 2	Clean and jerk—singles to 6 maximum efforts Front squat—singles to 1–6 maximum efforts
Afternoon	
	Repeat morning complex
Evening	
	Repeat morning complex
Tuesday	
Repeat Monday's training schedule	
Wednesday	
Session 1	Power snatch—singles to 6 maximum efforts Rest 30 min
Session 2	Power clean and jerk—singles to 6 maximum efforts Back squat—singles to 1–6 maximum efforts
Thursday	
Repeat Monday's training schedule	
Friday	
Repeat Monday's training schedule	
Saturday	
Repeat Wednesday's training schedule	
Sunday	
Morning	
Session 1	Less formally structured training

the six maximum attempts. Lifting is terminated at the 45-min limitation. The athlete then may recline while listening to music for 30 min. The second session of the complex involves the clean and jerk performed in the same progression pattern. Less time is required since less warm-up is necessary. Front squats with several maximum singles follow the clean and jerks. Training is terminated at 45 min. The same progression pattern is employed for the power snatch, power clean and jerk and back squat during the Wednesday and Saturday morning complexes (Table 25.1).

Variation seems limited on first inspection, but the following variants are available at the discretion of the supervising coach: (i) number of maximum lifts per session, per day and per week; and (ii) number of complexes per day. In addition, the maximum weights for each day will vary with the condition of the athlete. These weights are utilized as indicators for the planning of future training by the supervising coach. This system requires close supervision. Consequently, the ratio of athletes to coaches must be small. Three coaches are assigned to the 20-man senior team, with the periodic assistance of personal coaches. These coaches must be able to identify characteristics of each phase and make appropriate adjustments to the training.

In the competitive phase the same exercises are used on the same day as in the preparatory weeks. The number of times that the complexes may be performed is reduced to 1 or 2 times per day on Monday, Tuesday, Thursday and Friday. The number of times that the weights are reduced and then reloaded to maximum may also be varied during a workout in this phase.

Soviet-derived training

The Soviet-derived system may be even more diversified than it appears to be on the surface due to the aforementioned geopolitical factors. The widely dispersed elite-level coaches tended to develop and emphasize the successes of their own training methods, albeit within fairly narrow limits. This situation may lead to more variation in training programme design, especially when considering the lack of prolonged strong leadership that Bulgaria has enjoyed under former national coach Ivan Abadjiev.

The Soviet system utilizes a greater variety of exercises, more variation of these exercises, and fewer training sessions per day and week. All movements designated as 'hang' may be performed from three different heights above the floor. The issue of percentages is discussed in the next section.

The Soviet system also utilized diversified non-weightlifting activities in what is collectively termed active rest. Active rest normally involves calisthenics, running and jumping

Table 25.2 Reference maxima to determine weights for each exercise.

Exercises	Reference lift for 100% weight
Snatch, snatch pull, power snatch, snatch deadlift	Snatch
Clean and jerk, clean pull, power clean, clean deadlift, front squat	Clean and jerk
Press	Press
Good morning	*
Back squat	At least 125% of clean and jerk

* The style of performance will dictate the maximum weight.

drills, swimming, competitive games and similar activities that encourage the development of competitiveness, anaerobic endurance, motive qualities and increased localized circulation.

The notation of the accompanying training programmes (Tables 25.3 & 25.4) is (70%/3)3, where the numerator is the percentage of maximum, the denominator is the number of repetitions per set, the number following the parentheses is the number of sets, and a lack of parentheses indicates a single set.

The determination of the 100% weight

In order to determine the various intensities used in the exercises, the 100% weight must be determined. At various times some systems have used the maximum weight attained at the end of the previous competitive year as that figure. Other systems use selected goal weights for the upcoming season as the 100% figures. There is now some agreement that the 100% figure is a temporal one and based on the existing circumstances. The Romanians, who only utilize figures of 80% or higher, realize that the figure must be determined by the current training conditions (Ajan *et al.* 1988) although they provide no definitive methods of making this determination. The Greeks use the heaviest weight lifted in the previous session as the 100% figure for the current session (Iliou 1993). The Nigerians work up to 100% maxima each morning before the formalized training sessions begin (Ganev 2000). This approach places somewhat of a burden on the coach to select an appropriate means by which to determine the 100% weights, and in all probability will require some adjustments during the course of the training.

The training of women

Women's weightlifting, officially inaugurated in 1987 by the first Women's World's Championships, is rapidly passing through developmental stages. It is now an Olympic medal sport and had seven different weight classes contested for the first time at the 2000 Games of Sydney. The training of female lifters apparently varies little from the training of males since the intensities are commonly based on personal maxima. Blood testosterone levels and the ability of the female body to maintain them as training load drops before competition appear to be the main physiological factors in the designing of training.

The Chinese are the dominant nation in the sport, having won the team title at every Women's World Championship. Some anecdotal information has come forth regarding the effects of the menstrual cycle on training. Some female athletes were found to train most effectively during postovulation and postmenstrual periods while others seemed to experience little variation with respect to their menstrual cycles. As of 1993 the Chinese considered menstruation to have some effect on training (Cao 1993), but by 2000 it was not considered to merit any serious variation in the training program (Ma 2000).

Two variations employed in the training of Chinese women are the employment of more

Table 25.3 Soviet preparation week.

Day 1
Morning
1 Press: (60%/3)2, (70%/3)2
2 Snatch: (60%/3)2, (70%/3)3, (80%/2)2
3 Front squat: (60%/4)2, (70%/4)23, (80%/4)2
Afternoon
4 Hang clean and jerk: (60%/3 + 1)3, (70%/3 + 1)2, (80%/3 + 1)3
5 Clean pull: 70%/4, (80%/4)2, (85%/4)2
6 Good morning: (X/8)4

Day 2
Morning
1 Power snatch: (65%/3)3, (75%/3)2, (80%/2)2
2 Power clean and jerk: (60%/3 + 1)2, (70%/3 + 1)2, (80%/2 + 1)3
3 Jerk: (70%/3)2, (80%/2)2
4 Eccentric snatch deadlift: (80%/3)6–20 s descent
5 Eccentric clean deadlift: (90%/3)6–20 s descent

Day 3
Active rest

Day 4
Morning
1 Press: 60%/4, 70%/4, (80%/3)2
2 Clean and jerk: (60%/3 + 1)2, (70%/3 + 1)2, (80%/3 + 1)2
3 Back squat: (60%/5)2, (70%/5)2, (80%/5)2
Afternoon
4 Hang snatch: (60%/3)2, (70%/3)2, (75%/2)3
5 Snatch pull: (70%/4)2, 80%/4, (90%/4)2
6 Good morning: (X/8)4

Day 5
Morning
1 Snatch: (60%/3)3, (70%/3)2, (80%/2)2
2 Hang clean and jerk: (60%/3 + 1)3, (70%/3 + 1)2, (80%/2 + 1)2
3 Snatch pull: (70%/4)2, (80%/4)2, (90%/3)2
4 Front squat: (70%/5)2, (80%/4)2, (90%/3)2

Day 6
Morning
1 Power clean and jerk: (60%/3 + 1)2, (70%/3 + 1)2, (80%/2 + 1)2
2 Jerk: 70%/3, (80%/3)2, (90%/2)2
3 Back squat: (70%/5)2, (80%/5)2, (90%/3)2
Afternoon
4 Hang snatch: (60%/3)3, (70%/3)2, (80%/2)2
5 Snatch pull: (60%/4)2, (70%/4)2, 80%/3
6 Slow snatch deadlift: (80%/3)6–10 s

Day 7
Complete rest

Total repetitions: 582

X, an extremely variable weight from one individual to another with a varied relationship to either of the two competitive lifts (see also Table 25.2).

Table 25.4 Soviet competitive week.

Day 1
Morning
1 Snatch: (70%/3)3, (80%/2)2, (90%/1)2
2 Clean and jerk: (70%/2 + 1)3, (80%/2 + 1)2, (90%/1 + 1)2, (100%/1 + 1)2
3 Jerk: 70%/2, 80%/2, 90%/2, 100%/2
Afternoon
4 Front squat: (70%/3)3, (80%/3)2, (90%/3)2
5 Snatch pull: 60%/3, 70%/3, 80%/3, 90%/2
6 Good morning: (X/8)4

Day 2
1 Power snatch: (60%/3)2, (70%/3)2, (80%/2)2
2 Power clean: (60%/3)2, (70%/3)2, (80%/2)2
3 Clean pull: (80%/3)3, 90%/3, (100%/2)2
4 Back squat: 70%/3, (80%/3)2, 90%/3
5 Press: 60%/3, (70%/3)2

Day 3
Active rest

Day 4
Morning
1 Snatch: (70%/2)2, (80%/2)2, 90%/1
2 Clean and jerk: (70%/2 + 1)3, (80%/2 + 1)3, (90%/1 + 1)2
3 Jerk: 70%/3, 80%/2, (90%/1)2
Afternoon
4 Back squat: 70%/3, (80%/2)2, (90%/2)3
5 Snatch pull: 60%/4, (70%/3)2, (80%/3)2
6 Good morning: (X/8)4

Day 5
1 Hang snatch: 60%/3, (70%/2)2, (80%/2)2, (90%/1)2
2 Clean and jerk: 60%/3 + 1, (70%/2 + 1)2, (80%/2 + 1)2
3 Clean pull: 70%/3, (80%/3)2, (90%/3)2
4 Back squat: (70%/3)2, (80%/3)2, (90%/3)2
5 Press: (70%/3)2

Total repetitions: 324

X, see note to Table 25.3.

sets at high intensities for women (10 for women, 6 for men) and longer 'work' cycles between unload weeks (3 weeks for women and 2 for men) (Cao 1993; Ma 2000). There is also some variation between men and women in the frequencies with which specific movements are programmed into the training, although this could also be attributed to individual differences rather than those of gender.

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