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Upon resistance training periodization when is used deload setting manipulation approach: a practical recommendation

Direnç Antrenmanı Periyodizasyonunda Deload Set Manipülasyon Yaklaşımının Kullanımı: Pratik Bir Öneri

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Abstract

Linear or nonlinear resistance training programs provide volume-based manipulations to prevent fatigue. These can be optimized by using science-based deload week strategies. Deload set setting related training intensity, rest intervals as low training volume, to increase competition performance level undergone resistance training week. Deload is defined load reduce, injury prevention, fatigue prevention and recovery period. A possible as, it is help to training load increases over long term resistance training periodization. In general, when multiple sets are used and training load decreases, conducted over 1 week and a few days a week, the deload strategy can be an important training principle in terms of strength, power, hypertrophy, and endurance zones. Considering that deload sets detect one and more training load changes, can be optimize improvement in zone regimes depend upon each resistance training program. Further, strength and power gains are performance status whereas hypertrophy responses and endurance level detection are highly integrated to deload set strategies. Weekly periodization defined in different resistance loading principle to regulate loading changes, therefore, deload set setting regulate load and volume, primer outputs can be repetition and load manipulation. Indeed practical direction completed on resistance condition maintain advanced resistance training periodic development exhibiting intensity change in recovery period. Therefore, this practical approach explained on recommendation associated with current resistance training sciences. The study aim was to examine deload settings for training working principle exhibit resistance training volume-based manipulation and fatigue preventation and strength acquisitions.. In conclusion, deload set strategies can important periodic training adjust to load, set, and rest interval by prevent injury and neuromuscular adaptation.

Abstract: Deload, strength, power, periodization.

Öz

Doğrusal veya doğrusal olmayan direnç antrenmanı programları, yorgunluğu önlemek için hacme dayalı manipülasyonlar sağlar. Bunlar, bilimsel temelli yük azaltma stratejileri kullanılarak optimize edilebilir. Yük azaltma setleri, düşük antrenman hacmiyle antrenman yoğunluğunu ve dinlenme aralıklarını artırarak, direnç antrenmanı bölümlerinden geçen rekabet performans seviyesini yükseltmeyle ilgilidir. Yük azaltma olarak tanımlanan "deload" , sakatlanmayı önleme, yorgunluğu önleme ve toparlanma dönemi olarak tanımlanır. Uzun vadeli direnç antrenmanı periyodizasyonunda antrenman yükündeki artışlara yardımcı olur. Genellikle, haftada birkaç gün ve bir hafta boyunca uygulanan yük azaltma için birden fazla set kullanılır; yük azaltma stratejisi, kuvvet, güç, hipertrofi ve dayanıklılık bölgeleri açısından önemli antrenman prensipleri olabilir. Yük azaltma setlerinin bir veya daha fazla antrenman yükü değişikliğini tespit ettiği göz önüne alındığında, bölge rejimlerindeki iyileşme her direnç antrenmanı programına bağlı olarak optimize edilebilir. Ayrıca, kuvvet ve güç kazanımları performans durumu iken, hipertrofi yanıtları ve dayanıklılık seviyesi tespiti yük azaltma set stratejilerine büyük ölçüde entegre edilmiştir. Haftalık periyodizasyon, yük değişikliklerini düzenlemek için farklı direnç yükleme prensiplerinde tanımlanır; bu nedenle, yük azaltma setleri yük ve hacmi düzenler; temel çıktılar tekrar ve yük manipülasyonu olabilir. Gerçekten de, direnç koşullarında uygulanan pratik yönlendirme, periyodik olarak gelişen ileri direnç antrenmanını, toparlanma döneminde yoğunluk değişimini sergileyerek sürdürmeyi sağlar. Bu nedenle, bu pratik yaklaşım, mevcut direnç antrenmanı bilimleriyle ilişkili önerilerle açıklanmıştır. Çalışmanın amacı, direnç antrenmanı hacim tabanlı manipülasyonu, yorgunluğun önlenmesi ve kuvvet kazanımı için antrenman çalışma prensibini sergileyen yük azaltma ayarlarını incelemektir. Sonuç olarak, yük azaltma set stratejileri, yaralanmayı ve nöromüsküler adaptasyonu önleyerek yük, set ve dinlenme aralığına periyodik antrenman ayarlamasında önemli rol oynayabilir.

Anahtar Kelimeler: Deload, kuvvet, güç, periyodizasyon

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Introduction

The resistance exercise and training adaptations during performance of sets complete rest between sets may be affect acute responses such as metabolic, hormonal and cardiovascular (ACSM, 2009). Appropriate performance is expected adequate recovery lead to increased physical capacity, another recovery provides reduction of fatigue and stress (Sousa et al., 2024). Other expectation for rest interval lenghts depend upon training intensity targeted between set and exercises when selecting load plans due to fatigue and injury preventation (Kreamer and Ratamess, 2004). Resistance training programs provide performance development contributes sport related injury through improving fatigue resistance, recovery, training skill and greater training volume is associated with further reductions in injury risk (Weerasinghe et al., 2026). Periodic plans of resistance training along to manipulation differently from multiple set set-ups is are one of resistance training week has been used deload strategy defined on training volume periodization (Coleman et al., 2024; Pancar et al., 2026). Current resistance training science periodization recovery week is deload strategy limited sport performance research and athletic performance development to prevent injury and training adaptation (Pancar et al., 2026). Periodic resistance training settings provide multiple zone working principles has been formed on loading, repetition and recovery strategies exitable to undergone training program, in directly deload set strategies are perform one and more differently resistance loading, linear set, specific recovery and training zone (Rogerson et al., 2024). Deload set section is a resistance training volume load performance able to resistance stages as resistance zone and repetition range (De Marco et al., 2024). In this way, resistance training periodization consists of loading phases has been performed in short sets, allowing for versatile resistance transfer that permits specialized training intensity arrangements in training planning (Coleman et al., 2024).

Resistance training manipulations and deload settings reported that greater performance increase plan used on an periodization for example according deload week to low set, short and long rest intervals, low intensity, and repetition promote strength and condition (Pancar et al., 2026; Schoenfeld et al., 2021). Advanced resistance training methods noted that various deload set approaches involving the manipulation of different areas in the daily training unit, but generally, rest intervals in the training phase are not a regime instead of training intensity can be decrease and increase simultaneously, thus recovery aimed at the purpose truely can deload settings to achieve training volumes (Bell et al., 2022). Bell et al (2023) the resistance training phases reported that induced training loads to adjust according training volume can used optionally to deload in multiple sets. Notable resistance training principle and manipulations in the resistance training phases were conducted for recovery under the influence of continuous persistence and recovery during training phases is very diverse, and, together with multiple sets have been supported the development of training according to its purpose (Bell et al., 2022; Bell et al., 2023). In this direction, studies supported that deload set strategies differ in daily, weekly, and monthly arrangements, and in applications depending on load volumes within the same training phase,

maximized development is targeted (Coleman et al., 2024; Pancar et al., 2026). Planning for training periods, both short-term daily and weekly, supports maximized development, while long-term training Whereas, rest interval periods are sometimes discussed in terms similar to 'tapering period,' but these two strategies serve different purposes such as load reduction is intensity decrease approach while tapering is training period duration times (Winwood et al., 2026). Tapering generally refers to a period in which the volume of training is reduced in the days or weeks leading up to a competition, usually with the goal of achieving peak performance, in contrast, the primary purpose of rest periods is not to achieve peak performance, but to increase preparation for the next training cycle.periods require more research (Murach & Bagley, 2015). Exactly, completed delaod settings promote maximize performance level. In this direction of this study investigation has aimed to deload set setting on training volume provide manipulation of resistance training periodization.

Deload strategy: when is used in the training cycle

Reduced training periods have been referred to as “light weeks”, “recovery weeks”, “recovery cycles”, and more recently, “load reduction”. Over the past few years, the term load reduction has appeared more frequently in the literature and has been explored in research on bodybuilding, weightlifting, mixed martial arts, and Brazilian Jiu-Jitsu (Bell et al., 2023; Bell et al., 2025). However, none of these studies have objectively defined what load reduction. Because of the lack of a clear definition in the research, Bell et al. (2025) published a practical application study to improve understanding by reducing the ambiguity surrounding load reduction. The study re-assigned a group of expert strength and physical sports coaches and developed a framework of good practice that sports scientists and coaches should follow when implementing load reduction (Rogerson et al., 2024). Based on this study, the following definition of load reduction has been proposed: “Load reduction is a period of reduced training stress designed to alleviate physiological and psychological fatigue, promote recovery, and increase readiness for subsequent training.” According to this definition, load reduction is characterized by a decrease in overall training load, intensity and volume demands, with the primary aim of increasing readiness by managing training-related fatigue and promoting recovery by load and intensity decrease and properly rest intervals (Coleman et al., 2024; Pancar et al., 2026). In this sense, the reduction in training stress manifests as a decrease in sport-specific stimulus (e.g., technical sessions), strength and conditioning (e.g., resistance training), or a combination of both (Bell et al., 2025).

Load reduction serves as a preparatory tool to increase readiness for subsequent training. Importantly, “next training” can mean that rest is placed between 2 training blocks (a common feature of strength and physical training) or, more infrequently (i.e., during a training block) (Coleman et al., 2024; Bell et al., 2025; Pancar et al., 2026). Rest can be strategically implemented at various stages of an athlete’s program to optimize performance and recovery. For example, in the pre-competition phase, rest intervals allow for fatigue reduction while maintaining training adaptations. In the competition phase, or in a tournament with intense competition days, rest intervals can help manage acute fatigue and prevent maladjustment (Bell et al., 2022). In RT programs, rest interval periods are frequently used to prevent potential performance drops and support

recovery. Whereas, rest interval periods are sometimes discussed in terms similar to "tapering period," but these two strategies serve different purposes such as load reduction is intensity decrease approach while tapering is training period duration times (Pancar et al., 2026; Bell et al., 2025). Tapering generally refers to a period in which the volume of training is reduced in the days or weeks leading up to a competition, usually with the goal of achieving peak performance (Pancar et al., 2026; Bell et al., 2025). In contrast, the primary purpose of rest periods is not to achieve peak performance, but to increase preparation for the next training cycle. Furthermore, rest periods are applied not only before the competition but also at various points throughout the overall training cycle (Pancar et al., 2026). Periodic deloading setups allow for pre-planned, autoregulation, or both as these periodization to reduce fatigue, adapt to training, prepare for manipulation changes in training phases, improve performance, prevent injuries, and manage high levels of external loads (Rogerson et al., 2024). Notable, a strategy for maintaining training overreaching for athletes and coaches, weekly deload have been reported as follows: 1-2 sessions, 30-60 minutes, 1-3 sets, 1-6 repetitions, and 60% to 84% of one repetition maximum (De Marco et al., 2024).

The implementation of weekly deloading is similar and involves a decrease or increase in weekly volume along with changes in exercises, and is directly applicable to all athletes, including powerlifting, physique, mixed 5-week program, weightlifting 4-week programs, and strongman 6-week program (Rogerson et al., 2024). Additionally, a 6-day program can also be used to adjusts training frequency and weekly sets by reducing the number of repetitions per set with single and multi-joint exercise selections (Rogerson et al., 2024). From a simple perspective, in new training blocks, progressive, repeated block weeks, repetitions of the previous week, and training intensity with increasing volume and intensity, training intensity decreases in set setups, and the absence of rest methods in short-term programs leads to undesirable results such as strength and hypertrophy reductions (Rogerson et al., 2024). A study comparing a long-term strategy (9 weeks) with conventional resistance training reported that a one-week rest in week 4 had negative consequences on strength and power gains, however, these results were obtained by defining the one-week rest as an exercise-free state with 8-12 repetitions, 5 sets, and 2 minutes of rest (Coleman et al., 2024). Therefore, a short-term rest strategy can reduce lifting load (intensity) by reducing the number of repetitions per set without changing the training volume, through potential gains in autoregulation and nonlinear periodization during exercise combination (Rogerson et al., 2024). This is a practice performed under temporary workload as part of the training segment during a period of reduced training intensity and before a competition (Bell et al., 2022). Typically, the coaches should be used to reducing the training load at the final week of a

mesocycle, or in the first week of a new mesocycle when a new training mesocycle is include new exercises (Bell et al., 2023).

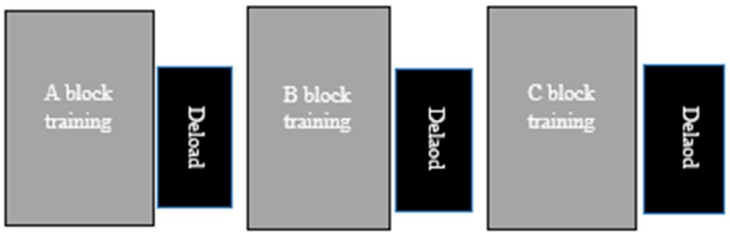

Fig 1. Deload strategy; A, B, C new training block while totally deload by training block is progressive, additional repeated block used to new training block.

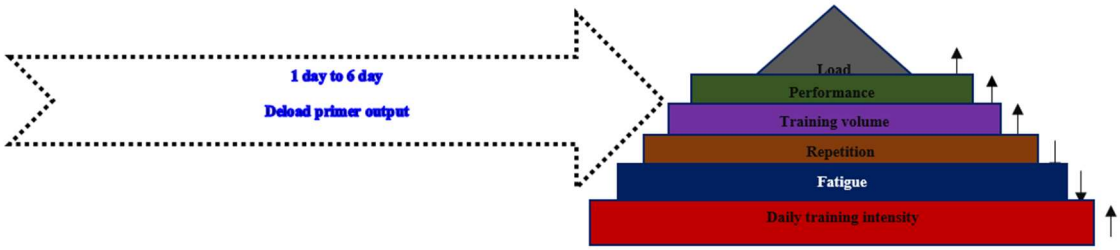

Fig 2. Primer output to deload set manipulation

Why is used deload week manipulation?

A load reduction is a resistance training strategy to training volume decrease reducing fatigue and provide recovery adaptation used perforamance increasing opportunity against gradual overload limitation through periodic load reductions in the periodic training volume and intensity programmes, its typical duration may be a week or a few days to increase strength gains (Bell et al., 2022). De Marco (2024) investigated resistance training prescription practices of strength and conditioning coaches stated that four common plan formed on deloading periods for example taper, competitive season, tournament and travel. According to the response statements, potential applications of a load reduction strategy may include increasing adherence to normal training, peaking performance, reducing injury, and decreasing the risk of overstraining and overexertion during with resistance training manipulation regimes (Bell et al., 2023). Another finding is that the mesocycle periodization, planned according to volume, intensity, and number of repetitions per set, is based on pre-planned training volume changes as a long-term periodization recommendation, however, other short-term periodizations not included weekly periodic load reduction set setups and daily training intensity adaptation to prevent fatigue (Bell et al., 2023; Rogerson et al., 2024). The pre-planned or autoregulated post-preparation training phases can be specific tasks for athletes' condition and performance level elevation, therefore, autoregulated load reduction set setups may be vary depending on weekly training volume. Accordingly, a resistance training program regarding of the periodization of weekly load decrease implemented on different sport population (Rogerson et al., 2024; Coleman et al., 2024). In generally stated this manipulated intensity methods influence determinant of strength

development and contributor to hypertrophy whereas volume manipulation relevant to adaptive potential training efficiency can be selected fatigue, movement velocity, regional hypertrophy and contraction spesific adaptation to specific goals but deload week manipulation has been limited only 1-2 session, 60-90 min, 6RM and 60-84 1RM% (Rios et al., 2026; De Marco et al., 2024). Individual periodizations therefore must be formed to enhance performance and to prevent overtraining (Brown & Greenwood, 2005).

Periodic deloading approach on one resistance training periodization

Progressive resistance training sessions regulate very high power gains for end-of-workout responses, and load-reducing set strategies can enhance normal training, as well as deliver peak performance, reduce injury, and prevent overtraining (Bell et al., 2023). Depending on varying training volumes, a specific periodization plan should be developed based on sets, volume, intensity, and repetition. Pre-planning should be based on long-term deloading strategy, not short-term, and weekly fatigue variations (Rogerson et al., 2024; Bell et al., 2023). Following pre-planning, or through autoregulation used for specific tasks in athletes, autoregulation involves load-reducing intensities that vary according to weekly training volume, and this program is a fatigue adaptation in load and repetition period (Coleman et al., 2024; Rogerson et al., 2024). Training load adaptation can be in the form of similar weekly volumes where each set differs for high load during rest periods, thus achieving load-reducing intensities (Bell et al., 2025). Load-reducing weekly set arrangements support weekly training increases or decreases and are sustainable in single and multi-joint exercises with reduced repetitions per set in weekly sets (Pancar et al., 2026; Rogerson et al., 2024). Training intensities in this direction support new block training, progressive training load, weekly block repetitions, and repetition weeks excluding rest modes to increase volume, and also support strength and hypertrophy responses that counteract the negative responses of decreasing training volumes (Rogerson et al., 2024; Pancar et al., 2026). The training reduction period demonstrated in decreasing difficulty and concurrent workload are strength and endurance responses as part of the training segment and pre-competition conditions (Bell et al., 2022; Pancar et al., 2026). Load reduction is a fatigue reduction strategy that provides recovery opportunities at progressive loads to reduce periodic fatigue, according De Marco (2024) weekly deload practical approach was typically reported as decreasing volume during resistance training periodization such as taper 89.1%, competitive season 70.4%, tournament 84.1% and travel 74:6% with most common reduction in resistance training volume as 0-25%. Depending on training volume, typical recovery sets under new training conditions can be applied for 1 week or several days (Coleman et al., 2024; Bell et al., 2022; Pancar et al., 2026). However, training load and repetition adaptations may vary according to the principles of weekly volume variation zones; high-load sets are added for load reduction adjustments, and daily practice is used to reduce training load (Bell et al., 2025).

Load reduction set strategies for weekly fatigue reduction can be used to improve strength performance in hypertrophic responses (Rogerson et al., 2024). However, pre-planned rest periods provide the coach and athlete with a "checkpoint" within the

training program where a conscious decision regarding the need for rest can be evaluated, rather than mandatory program changes being made solely based on predetermined time points. Autoregulation is a novel approach used in strength and muscle hypertrophy training to instantly adjust training volume or intensity based on daily fluctuations in readiness (Bell et al., 2025).

Table 1. General approach deloading using to training

Training parameter	**Recommendations**
Traning volume	Low recovery requirement: Reduced by 25-45% compared to normal training volume. Moderate recovery required: Reduced by 40-60% compared to normal training volume. High recovery requirement: Reduced by 60-90% compared to normal training volume
Training frequency	Reducing the number of weekly training sessions (compared to normal training) is a viable way to manage training volume. However, training frequency will generally remain unchanged (compared to normal training frequency). In cases of excessive fatigue, training frequency should be reduced as needed.
Training intensity	A decrease in absolute or relative intensity should be achieved by reducing %RM (10%) while maintaining repetitions.
Exercise selection	Increased focus on technique and a reduction in auxiliary exercises.
Recovery	Typical rest periods for structured recovery are 5–7 days. However, the duration of the recovery period should take into account the duration and intensity of the previous training block. For longer or more demanding blocks, a longer recovery period may be necessary, including a 2–5 day break from training.
Periodicity	A planned reduction in workload should be implemented every 4-8 weeks, and lighter training days should be introduced as needed using an automated adjustment approach.

Conclusion

Deloading strategy should be used in a sports-specific manner, with low loads and appropriate manipulations during training phases where load intensities increase or fatigue becomes pronounced during resistance training to powerlifters, resistance training men and different sport branches. Based on these results, it is thought that deloading sets, when applied for one or several days in annual and monthly training periodizations, can lead to increased strength and hypertrophy. In this context, deloading arrangements are an important sport-specific recovery task approach to improve performance at increased loads. In addition, since differences in the applicability of research results will be observed between long-term and short-term results, planning appropriate to the unit of training should be made. A practical approach that can be applied daily in progressive weekly deloading set arrangements to ensure training adaptation and prevent fatigue can therefore be important in the emergence of strength gains in response to training. According to deloading perceptions, it can be a training program designed to reach peak performance before competition; also, the purpose of deloading is to promote recovery and preparation. The design and implementation of deloading should be to increase the training demand in the

subsequent training cycle. Mesocycle sections can be positioned to include several load-reducing sessions, depending on the competition schedule and sporting demands.

Future direction

In that load reduction is generally applied once a week in long-term training or a few days a week, aiding in athlete recovery and increasing training volume, its application is limited in short-term resistance training. Accordingly, it has been reported that applying deload set strategies with appropriate rest and sets once or a few days a week in short-term periodizations will increase strength and power performance. Future research should examine the effects of strength measurements (e.g., maximum power, repetition count, power measurements) on broader aspects of morphology (e.g., muscle hypertrophy), technical/skill, and psychological measurements.

Kısaltmalar / Abbreviations

Yok / None

Beyanlar / Declarations

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During the preparation and writing of this study, all scientific, ethical, and citation principles outlined in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were strictly followed. No manipulation or falsification was carried out on the collected data, and this study has not been submitted to any other academic publication medium for evaluation. The author bears full responsibility for any potential violations that may arise in connection with this article.

Veri Ve Materyal Erişilebilirliği / Availability of data and material

Bu çalışmanın bulgularını destekleyen veriler, makul talepler üzerine sorumlu yazardan temin edilebilir. Veri seti yalnızca akademik amaçlar için erişilebilir olacak ve verilerin herhangi bir kullanımı, orijinal çalışmayı referans gösterecek ve katılımcıların gizliliğini koruyacaktır.

The data that support the findings of this study are available from the corresponding author upon reasonable request. The dataset will be accessible only for academic purposes, and any use of the data will recognize the original study and maintain the confidentiality of the participants.

Çıkar Çatışması / Competing interests

Yazarlar, bu makalede sunulan çalışmayı etkileyebilecek herhangi bir çıkar çatışması veya kişisel ilişkiye sahip olmadıklarını beyan etmektedirler.

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Researchers' Contribution Declaration:

Tüm yazarlar çalışmanın tasarımı ve planlanması, verilerin toplanması, analizi ve yorumlanması, verilerin düzenlenmesi, yöntemlerin belirlenmesi ve makalenin hazırlanması (özgün taslak, gözden geçirme ve düzenleme) aşamalarına eşit düzeyde katkı sağlamıştır. Tüm yazarlar makalenin önemli noktalarını eleştirel bir şekilde değerlendirmiş ve makalenin son hâlini onaylamıştır.

All authors contributed equally to the study design and planning; data collection, analysis, and interpretation; data organization; methodology development; and manuscript preparation, including the original draft,

review, and editing. All authors critically reviewed the important aspects of the manuscript and approved the final version of the article.

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